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STATISTICS

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BY THE LATE

SIR ROBERT GIFFEN

K.C.B., LL.D., F.R.S.

WRITTEN ABOUT THE YEARS 1898–1900

EDITED WITH AN INTRODUCTION

BY

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ST. MARTIN'S STREET, LONDON
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INTRODUCTION

When Sir Robert Giffen retired from the public service in 1897 he proposed to write a popular handbook on statistics, and so far carried out his intention as to complete the chapters now published. Like many old journalists he worked in spurts, often brilliant and sometimes sustained. But when he was checked for a considerable time he was frequently reluctant to resume his interrupted labours; and with each succeeding year he felt less and less inclined to complete a synthetic survey of the statistical field which dealt with the facts and figures of the end of the nineteenth century. It was not merely that the figures themselves needed revision up to date and that a library of official literature was required for the purpose. The twentieth century has already seen considerable modifications, both in the form and in the substance of our national statistics, and to bring the book abreast of the time would have needed an amount of rewriting and of tiresome compilation of new tables which discouraged further effort.

It sometimes happened in conversation with Sir Robert Giffen that some one present was able to clench and condense his argument by quoting one of the lapidary phrases with which the *Wealth of Nations*

abounds. The effect was always the same. Beaming with pride and pleasure Giffen would exclaim, "We are none of us wiser than Adam Smith!" A sufficient justification for the publication of this volume is the belief that in matters of statistics we are none of us wiser than Robert Giffen. Facts and knowledge may be out of date, wisdom never. The sagacity with which Giffen perceived and avoided the pitfalls of statistics amounted to something like instinct, not to be transmitted by statistical testament. But the thoroughness with which he interrogated his figures and all they stood for is well revealed in the following pages, and the acuteness of his reflection, if not so easily emulated, is informing, stimulating, and suggestive. This volume, small but illuminating, when it has ceased to be reckoned among the Literature of Knowledge will still remain among the Literature of Power.

Mr. G. Udny Yule has, with great kindness and ability, revised the proofs of the volume and seen them through the press during my absence from England. Some obvious corrections have been made, and it has been necessary to sacrifice some of the tables, which it was practically impossible to complete. As an illustration of the author's method of working, it may be mentioned that he sometimes sketched a skeleton table on the assumption that data were available for its compilation, and continued his argument, leaving the table for later consideration. In a few of these cases the tables would have needed to be modified or abandoned. In others, for example a long blank table showing under

different heads the proceedings for the recovery of debt in England, Scotland, and Ireland, it is possible that Giffen would have surmounted the difficulties which have deterred us from attempting to present it in a complete form. In the remaining cases it has been possible to give the tables with slight alterations, or merely to fill in the figures which were omitted. Apart from a few retouches the manuscript has in other respects been printed practically as it stood. A summary of contents and an index have been added.

HENRY HIGGS.

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CHAPTER I

INTRODUCTORY

I PROPOSE to write a handbook on statistics without giving a formal definition of the word. There are perhaps too many definitions in existence. It is sufficient for my purpose to recognise that there are considerable masses of knowledge which are composed of accounts and records of observed facts capable of numerical statement, and that there are scientific methods of compiling and arranging these facts and drawing conclusions from them. The facts referred to also are mainly observations with reference to the life of man in communities, although, of course, the scientific methods employed may be used for observations which have not a sociological character. What I propose to do, in short, is to deal with statistics as more or less popularly understood, without aiming at any exact definition, so as to make the study appear the more logical and scientific.

In coming to the study we find that there is a great deal of writing on the theory of the mass observations themselves. This is very properly the case. It is found, for instance, to take a very common

illustration, that in a given group of human beings, in the course of twelve months so many people will die ; although, therefore, no one can predict beforehand which individuals will die, the observation year after year that the numbers dying will bear the same proportion to the total number of the community constitutes a fact which can be reasoned upon. The set of observations thus made lays the foundation, in fact, for the business of life insurance. Accordingly, the theory as to how it is that there is so much uniformity in the rate of mortality, as it is called, and what the size of the community must be according to the theory of probabilities in order to give this uniform result, are matters for the most careful mathematical study.

Extensive as the writing is on this part of the subject, it seems to me to belong so much to the domain of mathematics that I propose rather to avoid it in a popular work which has another principal aim in view. I can only refer those who wish to pursue the subject to the book of Quetelet, dealing at large with the theory of probabilities and explaining how probabilities are made, and why they are to be depended upon.

There has been much debate also on the question whether statistics are a distinct science or not. But such a question, from the way in which I propose to deal with the subject, need hardly be discussed here, my object being to take the chief branches of what are popularly understood as statistics as I find them, and to apply scientific methods in the discussion of

them. It seems to be quite unnecessary to debate whether the whole field of statistics thus dealt with or a portion of it can be treated as a distinct science. The point must be noticed in passing, however, so as to prevent the supposition that it is neglected altogether. There are people who think that the study of man in societies by means of mass observations is entitled to rank as a distinct and separate science, which they call Demography. Others vehemently dispute the claim thus put forward, maintaining that the method of statistics is useful to many sciences, and especially to sociology, but that there is no separate science entitled to the name. I confess that controversies like this, purely verbal as it seems to me, are to my mind devoid of interest. It is not disputed that there are great masses of sociological facts which must be treated and handled by statistical methods, and that there is a group of scientific facts in consequence which can only be appreciated by those who follow such methods. Hardly anything can turn upon the question whether we give the name of a distinct science to such groups of facts or not.

The main fact always is that, apart from all such speculative theories, statistics undoubtedly constitute a branch of knowledge; that in the use of them scientific method is indispensable; and that whether a separate science can be constituted out of them or whether the statistical method and results contribute to several sciences, the knowledge which is derived from statistics in each study is frequently so separate that a distinct account can be given of each.

What is intended then is an examination, one after the other, of various leading branches of statistics which have come to be of visible importance. First of all, it is proposed to describe the various objects for which the different branches of statistics are intended; what the keeping of the records and the compilation of them are intended to effect. Next, it is proposed to give a description of the data in each branch of statistics and how they are obtained; and also an account of the methods of compilation and the pitfalls attending the compiler and the student. Finally, it is proposed to give an account, by way of illustration, of some of the principal facts established in each branch of statistics, and of the principal controversies and questions which the statistics have been in fact employed to discuss. It is only in this way, I believe, that the student can arrive at the knowledge of what the field of statistics is. The thing must be looked at in the concrete and in detail, or it cannot be made intelligible.

Special importance, it seems, must be attached to the question of what are the objects of any particular statistical record. It is not enough to observe the facts at random. Most of the records of statistics, although not all of them, are deliberately arranged to be kept by a community for the purpose of the information of the whole community. Before money is expended, therefore, in making the record, the Government of the community ought to have a distinct idea of the kind of information they wish to obtain, why they wish to obtain it, and in what way it can be

obtained at the least sacrifice and cost. It might be interesting to know, for instance, the number of dwellings in a community according to the different number of rooms which entered into each dwelling. For purposes of taxation and for the purpose of understanding fully the state of health of a community, as well as for other purposes, such a record as to the dwellings of a community may clearly be serviceable. But it is equally obvious that although the record might be extended to counting the number of panes of glass in the windows in each house, or the number of chimneys, or say the number of slates upon the roofs of the houses, the State would then be directing the collection and compilation of facts that would probably be entirely useless even if they were collected. The object, then, of any particular statistical record is the first thing about it to be studied, and both the Government in making the records and the students who come to use them afterwards should have the most distinct ideas upon this point.

I shall have occasion to deal with many special cases of this sort in the course of the book, but I should like to notice here one case as to the objects for which statistical records are used which has always interested me. This is the case of the records of the movements of trade. There is a very complete record of the movements in our foreign trade. We take note of the quantity and value of goods coming into the country and the quantity and value of goods leaving the country; we also take note of the number and tonnage and nationality of the ships which carry

these goods, as well as the passengers going to and fro between this country and foreign countries. Yet there is no similar record of the movement of goods in the home trade. We do not show imports into the south of England from the north of England, and the exports from the south to the north; nor do we show like facts for any other part of the home country in its dealings with other parts of that country. There are historical reasons why this distinction should be made, and, as I shall show later, it is almost certain that the origin of the complete statistics of our foreign trade was the desire of Governments to make the foreign trade the subject of taxation. But it is not so easy to show that we should put ourselves to a great deal of expense in connection with this foreign trade when we utterly neglect obtaining similar information as to the home trade. I should add that this is not merely a speculative question of my own imagining; at one of the International Statistical Congresses which have been held during the last forty years, distinct proposals have been made by ardent statisticians for recording movements in the home trade, just as movements in the foreign trade are recorded. The proposals have not come to anything, as Governments are obliged by the necessities of their position to be illogical in such matters, and not to spend money in getting new records because logic would seem to require them to do so. But the fact that such things have been proposed shows that there must be reason and method in the business, and that we must not assume everything to be right in the

collection of the statistics we have and in the omission to collect statistics on other subjects.

Equally important with the study of the objects of statistical records is the study of the data and how they are to be obtained. Nothing seems to be easier to the uninitiated in these matters than to say, "We want an account of such and such a matter," and the thing has merely to be ordered to be done. Some years ago, for instance, there was a great outcry as to the want of statistical information regarding the unemployed. The officials of the local government were forced to get together some show of statistics in order to satisfy the authorities. What they did was to send about enumerators in certain districts to ask every one whether he was employed or not; and on this basis a return was given, under protest by the Department, of the numbers of so-called unemployed. It has since been recognised universally, however, that such statistics, collected in such a way, were totally useless because, in the first place, they were made without any definition of what the word "unemployed" means, and in the second place, the source of the information, viz., the statements of people who called themselves unemployed, was not itself a good one. Those who wish to follow up the subject cannot do better than study the report on methods and agencies for dealing with the unemployed, which was one of the first works published in connection with the Labour Department at the Board of Trade. It will there be seen that it is not even an easy matter to define an unemployed person; that there are people

in trades which are necessarily fluctuating from season to season and from period to period, and that the question necessarily arises whether a man in the slack season or in the slack period ought to call himself unemployed in the sense in which the words are used, when he has sufficient occupation in the busy seasons or in the busy periods to make a living, just as if he had regular employment every week and every day of the year. Similarly, the question has to be settled whether a man who is on strike is unemployed, whether a man who is an invalid is unemployed, and so on. Always a careful definition must be made before figures can be of any use. Then it has to be seen that the method of getting and verifying the figures is adequate.

Another illustration may be given. The public cry out, for instance, that they wish to know the number of emigrants and immigrants from and into their country. But when it comes to business, the question of definition again arises. Every passenger on board an outgoing ship is not necessarily an emigrant. Distinction must clearly be made; and if you are to do it thoroughly, how many agents will be necessary to go about among passengers and find out who are emigrants and who are not! As a matter of fact, even if you do find out by an elaborate agency, it is impossible to know, when emigration is going on, how many of these passengers will really settle in the countries to which they go, and how many will come back after longer or shorter intervals. It is the same with immigration. If the thing is to be gone

into in the way that some people require, there must be an agency to go through the numbers of passengers arriving in the country and distinguish who are coming back or coming for the first time to settle, and who are merely passengers. The problem of statistics is really so hopeless in this form that it has been found more convenient to deal with the whole record of passengers departing and arriving, and to strike a balance at the end of the year so as to show what the net emigration or the net immigration is. Such a record may be incomplete in many ways, as not giving particulars of the nature of the emigration and immigration strictly so called, but it has the convenience of giving approximately the balance of the population. At any rate, it is always necessary in working out a particular branch of statistics to see whether the object desired cannot be attained indirectly at a moderate expense, when there are clearly great difficulties and the prospect of great expense in dealing with the subject in the most direct manner.

These illustrations are given from my own experience in official life. But in the course of the book a great many others will necessarily appear. All that is intended at this point is to show the importance, as a matter of logic, of studying the nature of statistical data and the methods by which they are procured.

When the data are procured and recorded the use of them has to be carefully watched. They are necessarily full of dangers to the unwary, partly because of the limitations of the correctness of the

data themselves. To keep to the subject of emigration and immigration, which has already been referred to, it is easy to see that the records of the out-going movement of passengers and of the in-coming movement, covering several hundreds of thousands of individuals in the course of a year, may themselves be very complete and trustworthy, but when the balance of population comes to be established the percentage of error may be such that within a few hundreds or even a thousand or two it may be impossible to reason from them as if they were absolutely correct. An error of 1 per cent in a million, for instance, would be 10,000; and if the balance of population one way or the other is about 10,000 only, on a movement of a million passengers each way, then it would be quite impossible to argue whether the balance is 9000 or 10,000, or even to argue upon a wider variation such as 5000 or 10,000. When the balance rises to 40 or 50 or perhaps 100 thousand the nature of the data is such that that balance may be depended upon within limits of 5 or 10 per cent, and the result may be a figure which is good enough for practical discussions; but in any discussion where closer figures are required, clearly the data are not sufficient to supply an adequate basis. It is the same through the whole field of statistics. Again, data that are good enough for one purpose may not be good enough for another. For instance, in the case of imports and exports the data may be quite good enough for the information of the people concerned as to a particular trade. The

imports of sugar, for instance, and the exports, may be stated with accuracy to a few thousand hundredweights, and upon a trade of great magnitude this degree of correctness may be quite sufficient. But when we come to use the statistics for such a purpose as showing (for comparison with other countries) the degree of the excess of imports in proportion to the whole trade, then it may be found that the data are not at all adequate in consequence of imperfections of valuation and other difficulties. This will also be a subject of frequent illustration during the course of the present book.

The account of some of the principal facts established in each branch of statistics, and of the principal controversies and questions which the different branches of statistics have in fact been employed to discuss, will make up a large part of the book. The main uses of statistics may not be controversial at all. In a quiet way they are applicable for the information of those interested, and this quiet use of them may go on and may frequently be the principal matter, while attention is for the most part concentrated on one or two special subjects which happen to attract public interest. Nevertheless the discussion of these special controversies and questions must always be specially referred to in a statistical handbook. To give an idea of what is here meant, one or two of these special controversial topics may be described. There is, for instance, the great vaccination controversy. In relation to the whole field of mortality statistics this question is no doubt a small

one. Whether vaccination is good for anything or not, it would still be expedient to have statistics of the rate of mortality generally, and of the rate of mortality due to specific diseases; but the question of vaccination occupies so much of the public mind that quite a disproportionate amount of attention has been given to it, looking at the subject from a purely scientific point of view, and it is therefore necessary in a popular handbook to give some account of the discussion. To take another illustration from a different field. Statistics relating to imports and exports, and to trade and production generally, are probably amongst the most useful of all in the daily business of life. Almost every merchant and man of business finds it necessary to have some regard to the statistical position of the trade or business itself. The trade could hardly go on in these modern times without a common knowledge of the principal figures relating to it. We find, however, that in the public discussion and the public use of such statistics, one or two questions occupy the public mind to the exclusion of others. There is, for instance, the perennial question of the balance of trade, the excess of the imports over exports, or the excess of exports over imports. This exercises a great deal of fascination over some people's minds, till it would almost seem that the statistics of imports and exports themselves must have been devised in order to throw light on this controversy. The figures are also being constantly used in connection with discussions regarding the policy of free trade and protection, and here again

it seems to be thought in some quarters that the whole use of trade statistics was to throw light upon such a controversy. It becomes necessary, therefore, in a popular account of trade statistics to take notice of these controversies, although in reality the employment of the statistics in such controversies may be a very small part of the uses for which they are intended. While noticing such controversies and questions, however, care should be taken not to exaggerate their importance, but to exhibit them in their proper relation to the whole field of statistical knowledge.

While the main objects of the book will be what has thus been described, one or two other matters will necessarily receive attention. A good deal will have to be said, amongst other things, as to the rules to be followed in arranging statistical tables, either singly or in a series. We have not merely to deal with the study of statistics as a subject of knowledge, but we have also to look upon them from the point of view of a workman who has to make statistical tables, so as to throw light upon a particular inquiry, or to establish a particular argument. The art of constructing tables, and especially a series of tables, becomes, therefore, one of the proper subjects for a statistical handbook. The same with statistical diagrams, to which many attach no small importance. Another matter of which some account must be given is the nature of the libraries of statistical books which are poured forth, especially by Governments, in the course of every year. Especially some account must

be given of those books of reference called Statistical Year Books, and Abstracts in which the principal figures contained in the more elaborate volumes are extracted for general use.

It is proposed also to devote a special chapter to the question of the uses of statistics in economics, and to the development of a special branch of the study of political economy, in which the application of economic principles and theories to the concrete problems of the modern business world will be considered.

It will be observed that the programme thus laid down is not a formal one. It appears, however, to correspond to the undeveloped state of the study of statistics at the present time, and to the lack of observations on many subjects extending over long periods which there has not yet been time to make.

CHAPTER II

AREA AND POPULATION STATISTICS

If we leave out of consideration certain outlying branches we may say, as regards almost all the statistics which people think of when the study of statistics is referred to, that there is continual reference in them, expressed or understood, to the units of area and population. Statistics, in fact, in their various forms relate to societies of men, and the two principal factors in forming each society are its numbers and the extent of the earth's surface which it occupies. We must begin, therefore, in such a work as the present by giving an account of the statistics of area and population by themselves.

Answering first of all, as to these particular branches of statistics, the question which we have stated must always be put, viz., What is the general object of the statistics? we have to say that beyond all question the primary object of statistics of area and population is military, with which may be connected taxation, which at first was undoubtedly imposed mainly for military purposes. Almost from the beginning, when human societies were formed, the

rulers of those societies must have had information as to the extent of their territories and the numbers of people, principally the numbers of fighting men, contained in them. We do, in fact, find in the oldest records of civilised communities, such as the old records of the Egyptian State, for instance, the most distinct evidence that the rulers were acquainted with the numbers of their population and the resources of the State, and that their acquaintance with facts of this nature extended to neighbouring States. From the moment, indeed, when rulers were able to put armies together, they must have had means of knowing not merely their actual strength at a given moment, but how that strength could be recruited. In other words, the numbering of the population must have been one of the earliest things which the State undertook.

These objects obviously also remain of primary importance to almost every State. There are some few States which exist on sufferance where it may appear unnecessary to take account of their force from a military point of view, because the force is quite inconsiderable for any purpose of contention with their neighbours. But these States are very few, and even a small State like Switzerland finds it useful to be able to develop a military force, although by itself it could not hope to contend successfully with any one of four or five great neighbours. A really independent State, however, holding an important place in the world, must occupy itself with the question of its numbers as a means of its defence, and

in connection with its numbers the area which it possesses.

While these are the primary objects of area and population statistics, others have become very important in modern inquiries, and there is no doubt that, apart from military purposes, statistics of area and population would still be most indispensable. It is expedient, for instance, now that so much attention is given to the social and economic conditions of communities, to obtain some idea of the average wealth and income in a particular community per head; some idea of the mortality, birth, and marriage rates; some idea of the proportion of the emigration or immigration; of pauperism; of criminality, as well as of the amount of trade and other matters, which must always be reckoned in some form or other per head, before the facts can be fully reasoned upon. It is obvious also that if one State is to be compared with another, or if one State is to be compared with itself at different times of its past history, there must be an account of its population and territory, so that all the facts can be stated as so much per head. Population statistics are thus the foundation of a great deal.

The second question we have to answer is as to the nature of the data in this branch of statistics, and the means of obtaining them. As far as area is concerned, the method, of course, is that of actual measurement, and as regards population, the method is that of actual counting or of a census. It may be pointed out, however, that although actual surveys and actual

enumeration are now resorted to, less perfect methods could to some extent be used, and would yield sufficiently trustworthy results for many purposes. The rulers of States, prior to the institution of formal surveys and censuses, were not entirely ignorant on matters so vital to them, although they did not apply methods with which we are now familiar, and which we are partly able to apply through the development of scientific knowledge and the use of instruments. We have merely to look into some of the old calculations as to the population of England, based upon the number of hearths subject to the hearth-tax, or based upon the results of an actual poll-tax, to see that public men were not without means of knowing something of the population of the country. Apparently at first sight there were widely different estimates, but it will be found on the subject being looked into, that differences were thought to exist which were not real differences, because estimates made at different dates were compared with each other, and the unwary were disposed to think that they contradicted each other, whereas frequently they were in accordance when allowance was made for the difference of time. We are long past the necessity of such calculations and computations, but we must not overlook the value of the work done by those who had fewer materials to work with.

With regard to the methods now used, I should like to point out that even as regards such a simple matter as area a great many practical questions have to be faced by those who make the survey. It is not

quite so simple a matter as it seems at first sight to define area. In a country surrounded by sea, and with many inlets from the sea, is it necessary or proper in taking the area to exclude every part of the land surface over which the sea at any time flows, or to take as the boundary the mean between high- and low-water mark? Is it expedient also to include in the area any portion of the sea surface which would be comprised inside of a line taken from headland to headland where the channels are narrow? Similar questions arise also as to the surface of fresh-water lakes and rivers inside the territory itself. The matter is not in every aspect perhaps very important, but every now and again interesting questions may crop up, and when minute comparisons have to be made, it may sometimes be necessary to see whether in some case the so-called area comprises water surface or not.

The survey in many countries, I need hardly add, includes a great deal more than the computation of actual area. An attempt is made to give an account of the nature of the soil, and almost, in fact, to value the soil for purposes of taxation. The survey must also show how much of the area is covered by houses, how much by roads, how much by railways and canals, and so on; how much, in many cases, by waste—that is to say, by land which either from its being mountainous or boggy is not susceptible of cultivation. For many purposes of comparison the nature of the area is, in fact, quite as important as the extent of the area itself.

With regard to the numbering of the population, the method now in use, as has already been stated, is that of an actual counting or a census at frequent intervals. Various methods, however, are employed in this actual counting. For instance, it is possible to make a count by means of officials stationed in different districts, each of whom is made responsible for counting the number of people in his own district. Another method, that followed in the census of this country and in most other countries, is that of distributing schedules to heads of families or houses, who have to fill up the required particulars, these particulars being finally summed up and supervised by the census officials. What I have to call attention to with reference to these schedules (and this remark applies to all other statistical compilation) is the impossibility of getting anything into the statistical records relating to a particular subject, unless that thing is included in the document which forms the foundation of the record. In drawing up a schedule, therefore, the compiler has to keep in mind what the ultimate use of the record is to be. Unless provision is made at the very beginning for the facts which he wishes to obtain, the whole census may itself fail.

With regard to a census also one or two other practical problems arise at the very beginning. One of these problems is whether the whole population is to be counted on one day or not. If one day only is to be used, a larger staff may be necessary than if a greater number of days is made available. The

officials might well, if they had several days before them, take a wide district, distributing schedules to one part of the district one day, and to another part on a later day, and so on. But if the whole has to be done at one moment of time, there must be an official staff for every district, so as to get the work through. What can be said is that one day is not absolutely indispensable, but if there is not a strict limit of time of this kind, great care must be taken by those who have charge of the census to prevent material duplications or omissions, since it is quite clear that if the count is on different days, one day for one district and other days for other districts, people who have moved from one place to another may either be counted twice over or not be counted at all.

Another puzzle which has exercised the minds of official compilers of statistics a good deal is whether the actual numbers of people found upon a given spot on one day are to be stated, or whether the figure of population is to be what is called the permanent or legal population—that is to say, the people who usually reside upon that spot. A good deal may turn upon this distinction for many purposes. For instance, health statistics in a particular locality may be affected by the consideration that a large portion of the people counted in the census do not usually reside there; or as regards some other district, that a large portion of the people usually residing there may, in fact, remove from it when they become ill, and if they die are counted in the mortality statistics of a district to which they do not themselves belong.

We may recur to this point in dealing with the mortality statistics themselves, but it must be referred to here as showing one of the difficulties which are encountered by officials in making up a census.

A census can hardly be confined to the mere numbers of a population, and it would be of very little use if it were so confined. It is obvious that the human units are not the same. The difference of sex obviously is of great importance; and then there are important differences between people in the prime of life and children on the one side, and old people on the other side. In order to have any idea of the value of a population it is clear that those who count must make a distinction between the sexes, and must make a distinction between the ages of the people. Even then there are, no doubt, great differences between the units left. But on the average it is a great step to have a classification made which distinguishes the sexes and the ages. Another important distinction as affecting the quality of a population is that of the condition of the adult population as regards marriage,—the conjugal condition, as the technical phrase is in the census returns. Other matters of interest are clearly the occupations of the people, all the more important in a varied industrial community: the question of the numbers in workhouses, prisons, etc.; the question how many are deaf or dumb or blind; the question of religious profession; the question of wealth or income, and so on. There are also such points, which may be very important in some States, as the nationality of the

people counted and the places of birth as distinguished from the places of residence. The variety of topics is indeed all but innumerable which may be included in a census.

It becomes a practical question of extreme interest then to define what topics are or are not to be included in a particular census. The experience of the United Kingdom seems rather to be in favour of a considerable limitation of these objects, in order partly to keep down the expense of obtaining the census itself, and partly to secure that the results are accurate and trustworthy, and that doubt is not to be thrown on the whole work in consequence of the difficulties attending some part of the work being supposed to extend to the whole census itself. Hence, in the case of England and Wales, the subjects on which information is obtained are very little more than the age and the sex of the population, the conjugal condition, and the nationality and the places of birth and, to some extent, the occupations. The topic of religious profession is omitted, and nothing is done in the census as regards the wealth or industry of the people. On the other hand, in the United States the census comes to include almost everything, including particulars as to the rate of mortality, and especially particulars of the most detailed kind as to the productiveness of the industry of the country. The expense of the United States census is accordingly many times greater than that of the United Kingdom, even allowing for the difference of population, while it may be doubted whether

the same pains are taken as to the primary object of the census itself, viz. the mere numbering of the population.

My own opinion is in favour of the practice of the United Kingdom rather than the practice in the United States. The main object of a census should be to establish the numbers, sex, age, conjugal condition and place of birth of the people. These facts are essential to many other branches of statistics. To go beyond them is to impose great difficulties on the compilers and to add greatly to the expense. If other objects are to be investigated, I should be disposed to recommend that there should be a census for that special purpose. It is not expedient to complicate the main census with them. Apart from the expense involved I am of opinion that hardly enough has yet been made of the primary objects of a census, and each addition of a new subject enhances the difficulties of handling the main facts which ought to be in the census.

The dangers of error and the pitfalls of which the compiler and the student have to beware in dealing with census figures, may now be considered. In the mere counting there is obvious risk of omission and of duplication, especially where the census is not taken on one day. The possibility of errors of great magnitude thus arising if ordinary care is taken, may not be serious, but it is plain that care must be taken by the authorities in charge of the census. Still, whatever care is taken there cannot but be, owing to the number of agents to be employed, and the

extent of the surface to be covered, a certain amount of error in the mere numbers of the people. For practical purposes, in the ordinary uses of the census figures, these errors are probably too small to give any serious concern, but I should hesitate to say that there are no cases in which, when dealing with the census minutely and working out fine conclusions, the risk of some error in the data should not always be kept in mind.

When we go into other particulars besides the mere counting of total numbers, the risk of error increases. Taking such a point as that of the ages of the people, for instance, we cannot but see that the original data are not altogether to be depended upon. In some form or other the authority for the matter of age must be that of the individual householder, who either fills up a schedule himself or gives the particulars to an officer of the Government who comes to him for the information. Many people, however, do not know their own ages with any exactness, and it cannot be assumed that a householder giving the ages of the people for whom he has to make a return, especially a householder who has many strangers within his gates, can be in a position to tell the ages of the different members of his household with any exactness. Let him make the best inquiry he can, he may still be thrown out. The errors, as a rule, may not be great, and when we come to deal with the population of a whole country they may compensate each other; but here, again, it cannot be said that

there may not be some questions in which the lack of extreme precision as to the ages is not critical. In one case, as is well known to people who have had the making up of official statistics, there is indeed a certainty of some error on a large scale. It has been noticed that there are more women at the ages 20-25 in the population of England and Wales, according to the census returns, than there were girls aged 10-15 in the previous census. The probable inference is that between 10 and 15 there was a general disposition among girls to claim the higher age, but later on in life the indisposition to admit the true age which existed between 10 and 15 had ceased to operate, and consequently the true statement of age at ages 20-25 was not consistent with the untrue statement which had been made ten years previously.

There are obvious difficulties again with such particulars as the occupations of the people. When individual returns are being made, it is natural for a man stating his occupation to say that he is a baker or a smith or a factory weaver, or that he follows some other definite occupation of that kind. But if we attempted to use the figures thus derived for the purpose of showing the number of people engaged in cotton manufacturing, for instance, we should be met with the difficulty that there are undoubtedly large numbers of people engaged in the cotton manufacture who have described themselves in the census as engineers, porters, warehousemen, and so on, there being nothing in the census figures to identify them specially with the cotton manufacture, although

in a return of the numbers of people engaged in cotton factories they would undoubtedly be entered. There is another well-known difficulty. People in workhouses and prisons are asked to state their occupation, and the occupations so returned may come to swell the numbers stated in the census as following these occupations. If we wish to state, however, the numbers of people actually employed in a particular industry, it would evidently be erroneous to include those persons who may describe themselves as smiths and glaziers and so on, but who (being actually the occupants of workhouses or of prisons) are not, in any true sense of the word, industrially occupied at all. It would take too long to describe how these difficulties are more or less got over in the actual handling of our census figures, or in the actual handling of the census figures of other countries. It is sufficient to note here that there is an obvious difficulty in the whole matter, and that no one should use the figures of occupation in the census or the corresponding partial figures derived from special returns as to the people engaged in factories, without considering very fully what the figures really mean, and how such difficulties as those referred to are actually handled.

Even greater difficulties, it is obvious, would arise in dealing with such matters as the education of the people and their religious professions in the census. It is easy as regards education, for instance, to put a question in the census paper as to whether A. B. is able to read or write. But what meaning will be

attached to those words by a particular householder is not so certain. The result may be a return, unless very special care is taken, altogether untrustworthy. As to religious profession again, except in the broadest way, the particulars can hardly be stated. Many people, if the question is put to them point blank, will say that they are members of the Church of England, or Wesleyans, or Catholics, or Baptists, or Salvationists, as the case may be. But as a matter of fact their adherence to a religious denomination may be of the slightest kind, in some cases, and not worthy of the name. When the return, moreover, comes to be made by the householder speaking for the whole household, it is very natural that he should disregard nice distinctions and insist upon putting down an answer of some sort. We have all heard the tale of a non-commissioned officer in the army who would recognise no other religious professions amongst his men except members of the Church of England and Catholics, classifying all the others as "fancy religions." To some extent such an idea will undoubtedly exist among those who have to collect particulars as to the religious profession of a population. Everybody will be put down, as a rule, if possible, under one or other of the great divisions, and the "fancy religions" will go to the wall.

It seems unnecessary to give further illustrations. We may merely add that the larger the number of particulars required in a census schedule, the greater is the danger of error. The difficulty of examination

by those who control the business increases with every addition to the particulars in the schedule.

When all is done, the difficulty of reasoning upon the figures which the census supplies remains. In comparing one province or district of a country with another, it must never be forgotten that the units all through may not be alike. It is certain that in even the very smallest country the inhabitants of one district or town are not exactly of a piece with the inhabitants of other districts, and we are all familiar with the wide differences in a country like the United Kingdom—between, say, the average population of the metropolis and the average population of such outlying districts as the west coast of Ireland, or between the average population of Lancashire or the south of Scotland and the average population of Hampshire or some of the other southern counties of England. In looking at the general numbers given by a census, therefore, we have always to remember that the units are not necessarily alike, and that the difference of quality which cannot be expressed in figures may be more important than the difference in mere numbers which the figures show. This appears to be especially necessary in comparisons between different countries. All will admit, when the fact is stated, the difference in quality between a European and a black population, or between the population of a country like Russia and a country like Germany or England. But in piling up numbers these differences are apt to be overlooked in some degree, and it is necessary in a preliminary study like

this to warn the student against the handling of figures at any time without considering the actual facts which lie behind them.

We now come to the description of some leading facts established in this branch of statistics, and of the controversies and questions which have arisen out of the use of population statistics, or in which population statistics have played a principal part. It will, of course, be understood that the account to be given on this head is mainly by way of illustration. A complete study of each branch of statistics so as to show the information gained from it and tell "all about it" would be impossible in a manual. What is aimed at is to give some concrete idea of the more important parts, and to show the relation of each branch to the others and to the whole field of statistics.

The main facts, accordingly, as to the population and area of some of the leading States of the world may be given as follows :—

[TABLE

POPULATION AND AREA AT LAST CENSUS (1890–96) OF SOME LEADING STATES, SHOWING THE NUMBER OF THE POPULATION PER SQUARE MILE.

	Area in sq. miles. Millions.	Population. Millions.	Population per sq. mile.
British Empire . . .	10·9	372	34
United Kingdom only . .	0·12	37·7	312
British India[1] . . .	1·6	287	184
British North America . .	3·5	5·1	1·8
Australasia	3·3	4·3	1·3
France and French Possessions[2]	2·7	80·3	30
France in Europe only . .	0·20	38·3	189
Germany	0·21	52·3	251
Russia[3]	8·7	123	14
United States . . .	3·5	62·6	18

[1] Including feudatory States.
[2] Including over-seas but excluding the Sahara (about 924,000 square miles).
[3] Including Asiatic Russia.

A simple table like this shows of itself, in accordance with what has been above said as to the variety of the units, what a little way the mere figures of area and population carry us in our knowledge of the resources of States. The difference between a population per square mile of 1·3 and 1·8 in Australasia and British North America, and that of 251 in Germany and 312 in the United Kingdom, or that of 184 in British India, immediately suggest endless varieties in the areas and populations concerned. The differences would be accentuated if we included smaller States like Belgium or Holland, or particular areas of the other States, such as Bengal in British India, or England alone in the United Kingdom, but the differences are great enough as they stand to show the necessity of using such figures as sign-posts

guiding the way to further inquiry. How far, for instance, are the extensive areas in Australasia, British North America, Russia, and, to some extent, the United States, by which the number of inhabitants per square mile is so much reduced, capable of being cultivated and occupied, or wholly incapable of being turned to any account? How far, again, are the populations of the empires, such as the British Empire, Russia, and France, homogeneous? The absence of a common measure and common denominator clearly makes comparison for the military purposes, which are among the primary objects of such figures, excessively difficult.

Another point of view which is suggested regarding these empires is the strength of the nucleus, the governing race, in comparison with all the others. The empires are, in fact, in this view, made up of contrasted populations and not of peoples whose totals can be added up properly for many purposes, though for some purposes they can be taken into account. The United Kingdom by itself has ten times the population per square mile which the rest of the Empire has, or nearly so; but its total population is only a tenth part of the Empire. The extension of the Empire, then, depends mainly on this one-tenth. Even adding in with it the white population of other parts of the Empire, that is, mainly the populations of Australasia and British North America, the total would still be barely 50 millions, or about a seventh to an eighth of the whole Empire.

The position of Russia is entirely different. Its

large population of 123 millions is known to be, for the most part, homogeneous, whatever its exact economic value may be. About 100 of the 123 millions are pure Russian. Its condition in this respect is the opposite of the British Empire, which has a small white nucleus among huge masses of different races, while Russia has little more than a fringe of subject races.

Again, in these comparisons between nations the peculiar position of Germany cannot fail to receive attention. While equal in its territory in Europe to France—but the territory on the whole, I believe, is not considered so productive or fertile as that of France—its population far exceeds that of France, coming not so very far short of that of the United Kingdom itself per square mile, and the population, as we know, is constantly growing. At the same time Germany visibly has not the outlet which England has in a great empire oversea, what empire it has being only a stretch with a small native and an infinitesimal German population. The figures seem to explain the feeling and desire among public men in Germany for an expansion oversea, although the similar feeling and desire in France, which has a smaller population per square mile at home than either Germany or the United Kingdom, with greater natural resources than either, and that population likewise stationary, is not so easily explicable.

A point for inquiry thus suggested is that of the room for growth in the different empires. This does not depend on population and area alone, otherwise

there could have been no such state of things as that we see in the United Kingdom, and to some extent in France and Germany and other old countries in Europe, where the populations largely subsist on the interest which other countries pay them and on a manufacturing power which enables them to live on raw materials and food brought from other places. But extent of territory, and of naturally fertile or otherwise profitable territory, is nevertheless an important factor. On this head then there appears to be more room for growth in the British Empire than in any other; making all deductions for unsuitable territory in both Australasia and North America, there is in both areas a vast field for immigration and for increase of population by excess of births over deaths. The German Empire has no such outlet, while the French possessions are likewise mainly in tropical regions. The facts are more difficult to appreciate as regards Russia, but it appears hard to resist the conclusion that Russia in Europe is practically settled up, or nearly so, while the parts of Siberia which can receive an overflow of population are by no means extensive, in comparison with the immense numbers of the Russian people and the rate at which they grow. Should this prove to be the case, remarkable developments are inevitable in Russia before one or two generations have passed away. Great as our own outlets are, and great as are the similar outlets in the United States, it seems probable that before a long time elapses, as time is reckoned in the life of nations and of communities like that of Europe, we may be

face to face with such a difficulty of expansion as that now confronting Germany, and which seems likely to confront Russia. This, however, is a subject which can only be hinted at here. It is not exactly the Malthusian difficulty which is in question—a doubt as to the means of feeding an ever-growing population. All that is implied is that a great change in the conditions of agriculture and other industries is approaching, when the human race must adapt itself to the necessity of having little new territory to spread upon, such as has eased the population difficulty in Europe, in the Malthusian sense, during the last century and the century which is now passing away.

A difficulty exists in the British Empire also with reference to the room for growth of its subject races. I refer especially to India. This subject will come up again when we deal with the agricultural statistics. When we notice, however, the high rate of population per square mile in India, and know how this is made up of higher rates still in large areas where the population have no means of migrating, we cannot but observe even at this stage how pressing the population question may be. In other parts of our black empire, principally Africa, the question does not yet arise. There has not been time for the *Pax Britannica* to reproduce the Indian conditions. Similarly, France has not yet had time to reproduce similar conditions either in Cochin-China or in Africa. But such conditions must infallibly be reproduced, with what consequences to the world remains to be seen. The problem as to subject races, it may be

remarked, may become even more urgent than that as to European races. The latter have in their favour a power of inventiveness and of capacity to use inventions which may long adjourn the day when the failure of means of subsistence to grow with increase of population will make itself felt. But the subject races have no such capacity, and it cannot be taken for granted that they can be taught enough to prevent the consequences which are inevitable when a population of small agricultural capacity keeps growing upon a limited soil.

Let us take next a table dealing with the population figures historically. The question of area is here comparatively unimportant, as the areas, with the exception of the African territory of the United Kingdom and France, have been much the same throughout, and the exceptions are for the present purpose obviously immaterial. The proposed table is as follows :—

POPULATION IN MILLIONS OF THE UNDERMENTIONED COUNTRIES AT DIFFERENT DATES COMPARED : SOME OF THE FIGURES, ESPECIALLY FOR EARLIER DATES, PARTLY ESTIMATED.

	1815–21.	1850–51.	1870–71.	1890–91.
British Empire	158	221	275	372
United Kingdom only . . .	21	27·7	31·8	38·1
British North America . . .	·700	1·9	3·8	5·0
Australasia	...[1]	0·7	1·9	3·9
India	136	190	234	287
France and French Possessions .	35	45·0	51·0	80·2
France (in Europe only) . .	30·4	35·7	38·0	38·3
Germany	24·8	35	40·0	49·4
Russia	45·0	68	86·4	123
United States	9·6	23·2	38·5	62·6

[1] Insignificant.

This table is necessarily somewhat rough. It is difficult to state the decimal figures for precisely the dates required. But it is quite easy to discern in the rough figures great changes in the political relations of the powers concerned. The prominent facts are: (1) The comparatively stationary condition of the population of France in Europe while all other countries exhibit a remarkable growth. (2) The singular growth of the population of the United States from less than 10 millions seventy years ago to over 60 millions about 1890. If the table had included the figures for Spain as well as France, a reason for the enormous preponderance of the United States over Spain in the recent war would have been apparent, Spain, like France, having been substantially without growth for many years, while its assailant has increased so rapidly, as we perceive. (3) The enormous growth of the British Empire, whose whole population has increased by a gigantic figure, chiefly owing to the growth of population in India by the excess of births over deaths, but not without an enormous growth also of the nucleus of the Empire, the population of the United Kingdom and of the colonies of English race together having increased from 21 to some 50 millions. (4) The growth of Germany in much the same confined space at home from a population of 25 millions seventy years ago to nearly 50, the most remarkable growth of any of the old western European populations; and (5) the vast growth of Russia. This is by no means to be compared in magnitude with that of the British

Empire, but the fact of its being the largest growth of a homogeneous population of the European type or quasi-European type makes it politically of peculiar importance.

It is needless to enlarge on the political speculations suggested by such figures. They have been in part anticipated by what has been said already on the comparative figures of population and area at the present time. But they emphasise some of the considerations which have been stated. The shifting of the balance of political power from France and minor countries in Europe in a like position and the rise of a power like the United States "leaps to the eyes," while the peculiar position of Germany as a country with a rapidly growing population and no territory to expand upon is also marked. A discussion as to what the whole change in the relative position of all the powers amounts to, and what it will amount to before long as these movements in population go on, would take us into too speculative a region altogether for such a treatise as the present. The subject is, however, one for the political student and for public men who have to consider the forces of different States in diplomacy and war.

Yet one more illustration before we leave these population statistics, this time to enforce the point of the different composition of different populations. In general, where populations differing widely, ethnologically and otherwise, such as Chinese or Hindoos on the one side and the Teutonic races on the other, are to be compared, this lesson does not

need to be enforced. But there are other differences, such as the different composition of different populations, otherwise like, as regards *age*, which may be important. In a paper which I read at Hobart in 1891 before the Australasian Association for the Advancement of Science, I discussed this point with reference to the populations of France, Germany, and the United Kingdom, showing the preponderance of the proportion of males in France above the age of 40 in contrast with the high proportion of males in Germany and the United Kingdom below 20, the latter countries accordingly having a much younger population. At that time, according to the last census then available, the proportion of males between 20 and 40, the prime of life, was much the same in all the countries, and the absolute numbers in Germany not much greater than those in France; but now, while the proportions are much the same, the growth of population in Germany has been such as to give that country finally a preponderance, which must also be an increasing preponderance, of males in the prime of life. The following is the table containing the latest figures.

[TABLE

TOTAL POPULATION AND TOTAL MALE POPULATION ABOVE AGE OF 20, IN MILLIONS, IN THE UNDERMENTIONED COUNTRIES, ACCORDING TO THE CENSUS STATED.

	France, Census 1896.	Germany, Census 1895.	United Kingdom, Census 1891.
Total population . .	38·5	51·8	37·7
Total male population .	18·9	25·4	18·3
Total male population above age 20 . . .	12·3	14·8	9·8
Total male population between 20 and 40 .	5·8	7·7	5·4

The figures speak for themselves. The unlikeness of France to both Germany and the United Kingdom is evident, and accounts in itself, assuming other factors of force to change in like manner, for the increasing relative weakness of France.

Other consequences, it need hardly be added, are also involved. The increasing strength of Germany and the United States in the commercial field and their rivalry with the United Kingdom is explained in part in this very way, as was pointed out at length in a Board of Trade Memorandum on the relative advance in the foreign trade of the United Kingdom, France, and Germany issued in 1897. Socially and otherwise, the increasing compression of population in Germany and the United Kingdom must have far-reaching consequences.

Among these controversies and questions we must rank first of all the famous discussion of the growth of population to which the name of Malthus is attached. We have already made some remarks

incidentally on this question, as it is obviously raised by simple and general figures of the numbers of population at different dates; but a direct account of the controversy on account of its historical importance must also be given. The book of Malthus, then, though it is known, and properly known, as a great economic work, was essentially a statistical book. Its facts and deductions are derived from the study of statistics of population during the previous century; many of them of an imperfect sort, but still for the most part sufficient to enable an acute reasoner like Malthus to draw out important deductions. The book and its theories have been much debated, and it is unnecessary here to express an absolute opinion one way or the other upon them. It is sufficient to note that the warning given by Malthus based upon the statistics of the previous century as to the tendency of population to increase faster than the means of subsistence, was apparently quite justified by the experience of the century from which he derived his figures. Undoubtedly, during the past history of the human race, the excessive growth of population has been checked by the agencies which Malthus refers to, viz. war, famine, and pestilence. Because, in fact, during the years which have elapsed since the book was written the human race does not appear to have increased quite so fast as the means of subsistence, and certain special causes having operated to make recent experience of the present century different from that of previous periods, it does not follow that the deduction which

Malthus made was useless. One of the uses of statistics is, in fact, to make a record of experience, and it may be the case that if a great growth of population has been possible during the century just past, from causes which Malthus could not foresee, yet in the long run the more general experience of the human race which he describes may be the more important to study. We must not assume that the special experience of the last few generations will be indefinitely continued.

Another subject which has been much discussed of late years is the growth of town populations at the expense of country populations among the nations of Europe and in the United States, where the population is of European descent. The importance of a discussion like this, sociologically and otherwise, requires no setting forth. The consequences to the human race as regards health, nervous power, and happiness are only too obvious. Here again it is possible that a great deal of the alarm which is felt may be misplaced. There is already a tendency in the reverse direction of more or less force, and there is also a tendency for large numbers of the population to live both in town and in country, so that the distinction as regards such members of the population between town and country hardly applies. Still, whatever the discussion may lead to, the data for it are necessarily supplied by the statistics of population, and the subject would hardly have become an actual one at all but for the statistics.

Another subject which has only been partially

discussed appears to be of considerable importance. It is found when population statistics are examined for a long series of years, that there is a continual shifting of the centre of gravity of population in almost every country. To look at our own country we find that at the time of the Norman Conquest the centre of gravity of the population of England was in the eastern counties, Norfolk and Suffolk having quite a special importance at that time. In after years the centre of gravity was steadily shifted to London and the southern counties, and London, of course, continues to be the metropolis and the absolute centre of population. Within the last century, however, there has been a shifting of population in the provinces of England, and Lancashire and South Yorkshire have grown to be almost as important as the metropolis itself. During the past century also Scotland, which counted for very little in population compared with England, has grown into considerable importance in mere numbers. On the other hand, Ireland, which ran England pretty close in mere numbers of population down to the early part of the nineteenth century, has since fallen away, both absolutely and relatively, and is now of little more importance in numbers than Scotland, and of much less importance when the relative forces of the two populations per head are considered. Looking further afield we see changes of the same kind continually going on. The case of the United States is obvious to every one, because it is the case of an absolutely new population of over 60 millions, growing up in

the world within a period of a century and a half. This shifting of a European population from Europe to a new continent is perhaps one of the most striking facts in the history of the human race itself. But we have the case likewise, as above stated, of Germany and the United Kingdom increasing enormously in their population during the past century, while that of France has remained stationary; a shifting of population which brings with it undoubtedly a shifting to some extent of the political balance of power in Europe. Quite recently too, Canada has begun to grow after the fashion of the United States. Russia is another case of a country growing immensely in population and drawing with it in other ways a shifting of the political balance. So long as there is political speculation facts like these must continue to receive no small attention. The facts are no doubt a little complicated on account of the difficulty which has already been stated, arising from the difference between populations in the character of their units. We cannot merely take the relative increase of numbers and make deductions from the mere numbers without some study of the qualities of the populations themselves. But the mere facts as to numbers suggest the problems to be considered.

CHAPTER III

BIRTHS, DEATHS, AND MARRIAGES—EMIGRATION AND IMMIGRATION

THE statistics of births, deaths, and marriages, and also of emigration and immigration, are closely related to the statistics of population dealt with in the previous chapter. The distinction between them may, in fact, be stated to be that whereas the census gives an account of population at a specified time, the records of births, deaths, and marriages, and of emigration and immigration, give an account of the *movement* of population. To understand the whole subject it is clearly expedient to know what the movement is, because the population is never the same from moment to moment, but is always changing. Certain qualities of the population are also shown by the record of such events happening to it as births, deaths, and marriages. So close is the connection between statistics of population, properly so-called, that is, the record of the numbers and certain leading characteristics of the population, and the statistics of births, deaths, and marriages, that in most countries, including England, the office in charge

of the census is practically the same as the office in charge of the statistics of births, deaths, and marriages. Statistics of emigration and immigration, although they also deal with the movement of population, are more apart. They have not always been instituted from the point of view of the movement of population at all, and have arisen partly in the conduct of administrative business by the Government, but their place in a general scheme of statistics must nevertheless be in connection with the movement of population.

The objects of this department of statistics, therefore, are very much the same as those of the area and population statistics themselves, to which they are supplementary. They deal more particularly with the growth of the population and with such characteristics as whether the population is long lived or short lived, and so on. But the population statistics themselves would be very incomplete unless they were supplemented in this manner.

A great variety of objects are, however, effected by means of this branch of statistics, apart from the main uses which they subserve as a supplement to the census statistics. One of these objects for which they have been used is the formation of a basis for life insurance. The primary idea of life insurance is that people in view of death, which will remove them in succession according to the rate of mortality of the class to which they belong, agree to subscribe so much annually to provide equally for those who die early and those who die late. The calculations necessary are complex, and vary with the rate of

interest assumed to be obtainable on investments; but the essential basis is the rate of mortality, from which is deduced the amount of subscriptions to be received from the survivors, if an annual payment is required, and the amount which will have to be paid from time to time out of accumulated subscriptions and interest. And the knowledge of the rate of mortality depends in the last resort upon the statistics of the number of deaths in proportion to the population at each age. It is not meant by this that the general statistics of deaths which are now issued form in any way the basis of actual life insurance business. These bases were, in fact, established for the most part in the seventeenth century and early in the eighteenth century, when death statistics themselves were extremely imperfect, and when a great deal of mathematical ingenuity was necessary to establish any basis at all. Subsequently the business of life insurance has so much extended that the insurance companies who carry it on find a better basis for their calculations in the records of that business showing the actual mortality among those whom they have insured at particular ages. Still, the idea was obtained generally from the statistics of mortality, such as they were, and these statistics are obviously still useful in checking, by more general figures, the experience of insurance companies themselves, and in furnishing the necessary basis for wide experiments by the community with regard to accident insurance and old age pensions which may yet be tried.

In connection with endowments where provision is made for children the statistics of births become of equal importance with those of deaths. Here again special inquiries have become necessary as to the number of children born of a marriage on the average among the class for which the endowments are proposed. But the general statistics are also of some use, showing the proportion of marriages to births, although they do not show the average number of children born to a marriage.

The problem of Malthus referred to in the previous chapter is also elucidated to some extent by the figures given in the statistics of births, deaths, and marriages. To complete the facts which are essential to the discussion of that problem, it is necessary to have some idea, not merely of the increase of population from census to census, but of the actual rate of growth of population, that is, the actual excess of births over deaths from year to year and the number of children annually born in proportion to the number of people married, or to the number of people at marriageable ages. The statistics of this nature also show the changes in population from time to time as regards the extent of the excess of births over deaths. It may be mentioned incidentally that this excess of births over deaths does not depend so much upon a large number of births as might at first be supposed. It is found, in fact, that, in populations where the birth-rate is by no means excessive as compared with other populations, the excess of births over deaths is nevertheless very great,

mainly because the children who are born are well cared for, and the whole population living under healthy conditions is long lived.

Great light is also thrown upon the condition of communities by the indications of the varying number of births, deaths, and marriages. It has been found by experience in past times that the number of deaths increases in times of difficulty and depression which in former ages were very often times of famine. It is still found by experience that the number of marriages and of births rather increases in times of prosperity; consequently there is an indication of the condition of a community, at least of the changes in its condition from time to time, in all these figures of births, deaths, and marriages.

An indication of the quality of a community as regards sexual morality is also found in the proportions of legitimate and illegitimate births, as to which there has been a large amount of discussion. It is obvious enough, of course, that in such figures there is only an indication which may be rebutted by evidence that in consequence of the more general practice of prohibition a community whose sexual morality is really low may have fewer illegitimate births than a community which is really more moral but which has no systematic, or very little systematic prohibition. Still, the induction may be useful as far as it goes, and if not used without inquiry as to other influences.

Perhaps, however, the most important of all the uses to which the statistics of births, deaths, and

marriages are put, is that of the question of the health of communities as indicated by the mortality statistics. Public health, in fact, may now be said to be one of the main uses to which these statistics are put. And so important is this aspect of them considered to be that the Superintendent of Statistics in the General Register Office is usually in this country a gentleman of the medical profession, and the medical profession rather claim that the officer should be one of themselves. The reason of this is that the principal data he has to deal with are the causes of deaths, and the study of the data as to the causes of death can only be properly conducted by one of the medical profession. This view seems a little doubtful, in the extreme way in which it is urged. An officer who is a good statistician, though not belonging to the medical profession, might, in fact, be more useful at the head of the business than a gentleman who may be a good student of medicine and a good medical practitioner, but who happens not to be well acquainted with statistical methods. Still, the fact of the medical profession attributing so much importance to the business, shows what a large part is assigned to these statistics of mortality in dealing with the public health.

Another use to which the statistics are put is that of throwing light on the question of measures for the prevention of disease. In fact, the great support of the sanitary system of the United Kingdom is undoubtedly the statistics of mortality, an improvement of public health being noted, especially as regards

epidemic disease, where adequate sanitary precautions are taken, and the spread of epidemics being frequently prevented by these precautions. These statistics existing, they are also used and can be used for a great many miscellaneous discussions, the nature of which it will be sufficient to indicate in the briefest manner. There are curious inquiries, for instance, as to the excess of male over female births, as to seasons in which births take place, the seasons in which deaths take place, the seasons when marriages are most frequent, the different proportion of the sexes in legitimate and illegitimate births, and many more topics of that kind. Some of these topics appear to be more curious than otherwise, but it is hard to say that any one of them is useless, as we do not know in what different directions it may be necessary to carry out physiological inquiries.

The data of the statistics of births, deaths, and marriages may be considered very good. They are largely, it will be observed, records that are obtained primarily for other purposes, viz., the registration of civil condition. The importance to a community of having an adequate record of births, deaths, and marriages for the convenience of the individual members of the community, hardly requires to be stated. The less perfect attempts at registry that were made before the institution of an official system is the best evidence of the natural demand that exists for having such records. We all know how the fly-leaf of the family Bible was used in former times for a record of births, and how this was supplemented

by the register of baptisms at church. The register of marriages at church was also found to be extremely valuable, however imperfectly it was frequently kept. The same with the registry of deaths, or rather with the registry of burials, which was the form that the most ancient records assumed; so much so that in conservative institutions down to a very late date, if not even at the present time, certificates not merely of deaths but of burial are required. I believe that the Bank of England down to a very late period continued to require a certificate of burial when a person died for the transfer of its stocks. All this shows that there is an urgent social necessity in a community for having an adequate record of births, deaths, and marriages quite apart from the statistical uses to which such a record may be put. But the data are all the better for being originally required for a different purpose, where all the parties concerned and the community itself have an interest in securing a true record.

The records in this country are further secured by the imposition of penalties upon those who are responsible; the parents of a child and any persons attending the birth are required to have it registered, under a penalty of 40s., within forty-two days of the birth. The relatives of a person dying, and even persons present at the death, where the relatives do not perform the duty, are required to give notice to the Registrar within five days of the death. The registration of marriages, again, is secured as part of the performance of the marriage ceremony itself. All

connected with the celebration of a marriage in which there was no registration as part of the ceremony, would be liable to penalties, and the marriage itself would probably be void.[1]

The combined effect, however, is that all the data of the statistics of births, deaths, and marriages, as regards the main facts at least, are all but absolutely trustworthy. The figures are such as can be used with every degree of confidence.

There are dangers, nevertheless, in the compilation of statistics even when the data are so well established at the beginning. There is an especial difficulty in the intrinsic nature of the subject in establishing the causes of death. The classification of diseases in itself is not a simple matter, and there is no doubt that as to many obscure diseases, or diseases which shade off into others, we cannot depend very fully upon the perfect statement of the causes of death even by the medical practitioners themselves. There are cases in which expert practitioners would differ in their diagnosis; and how can we suppose that less expert practitioners all over the country correctly diagnose such cases? The margin of error, however, is probably contained within narrow limits, and the figures as to the causes of death may undoubtedly be used with discrimination by medical men themselves. Then there is a great difficulty as to still-births. The law is not sufficient in its requirement as to such cases, and yet they are of extreme importance in connection with the question of infantile mortality itself. Although, also, great

[1] But not in Scotland.

care may be taken generally with registration in countries where registration is practised, it is not to be assumed in every case that this care is used. Many years ago I came across a remarkable instance of statistics that were rendered valueless by the carelessness of registration of births. This was in the city of Philadelphia, in the United States, where the annual reports of the city authorities showed an excess of deaths over births. I was so struck by this in a city like Philadelphia that I made inquiries, and found that the excess of deaths over births which was shown in the official figures was mainly due to the fact that the births themselves were not sufficiently recorded. The births attended by medical men were recorded, but the births attended by midwives did not receive registration at all, and so the entire record was incomplete. This was an extreme case of carelessness in the matter of registration which, I suppose, has long since been remedied. But where there is a possibility in the statistics of so much carelessness, those who make use of them should be very careful to make inquiries, and not accept remarkable figures without inquiring whether these figures are true.

Apart from the discussion of the Malthusian problem, the principal controversy which has arisen out of these statistics of births, deaths, and marriages appears to be the question of vaccination; at any rate this discussion has engaged a great deal of attention in this country during the last twenty years, and has come to the front within the last few years more

especially. The whole theory of the medical profession as to the value of vaccination has been assailed, and the appeal has necessarily been very largely to statistical evidence. A short account of this controversy, therefore, as far as the statistics bear upon it, may be useful. The main question, it ought to be understood, is not one to which we should primarily look for general statistics to give us the necessary information. The assertion of scientific men who have looked into the matter is that the process called vaccination gives a protection against smallpox to those who submit to it. Such an assertion must be established, if at all, by careful observation in detail. If it is found that among people exposed to the infections of smallpox the proportion attacked by smallpox among those who are vaccinated is less than among those who are not vaccinated, and if the disease is also milder, as a rule, among the vaccinated when they are attacked than it is among the unvaccinated, then there is a clear case established as to the value of vaccination. Now this is the assertion of the whole medical profession, based for the most part upon actual experience by the medical men themselves of what has come under their own observation. The medical profession may, of course, be under a false belief—one man may have taken the belief from another without thinking and without checking it sufficiently by any experience of his own; but as there is no motive for error, one would think that the widespread belief among a profession which is interested in the study of the subject would be

sufficient for the public, who have not the same means of observation.

The practice of vaccination is, however, popularly assailed, and it is both denied that vaccination gives any real protection and asserted that it does a great deal of harm.

As regards the first assertion, I am bound to say that the opinions of the medical profession have not, in fact, been seriously challenged. There may be doubts as to the degree and absoluteness of the protection given, but it is impossible on so wide a field of observation as the medical profession have been able to take in, that a mistake can arise upon such a point. There have been so many cases of populations decimated by smallpox and of epidemics being arrested by the widespread use of vaccination, that it is astonishing how the fact of vaccination giving protection can be at all disputed. The conclusion of the Herschell Commission, which issued its Final Report in 1896, appeared to place the value of vaccination upon a basis which even the most prejudiced of the anti-vaccinators, if they give their minds to the matter at all, would recognise to be sufficient.

With regard to the second assertion, viz. that vaccination does a great deal of harm, it must be obvious to any one who looks at the inquiry, that whatever harm vaccination may do in special instances, the assertion of its doing much harm is totally unjustified. Harm clearly arises in special ways, where an operator happens to be a little careless, or where

the wound of the vaccinating instrument is not properly attended to, and blood poisoning arises, as it might arise from any wound. But the number of cases of injury from vaccination is so insignificant that against its value generally these cases do not count. This is not the place to go into a detailed discussion of the matter. What I am anxious to impress is, as a matter of logic, that it is not enough to establish one or two particular cases of injuries being done by vaccination. The question is one of degree, and unless a sufficient degree and extent of injury are established, there is nothing to set against the wide utility of vaccination itself.

Into the political questions which have been involved in the discussion it will be altogether out of place to enter here. While vaccination may be a good thing, the question of compulsory vaccination, which, to prevent misunderstanding, I may say I am in favour of, is obviously a different thing. People may approve of vaccination and yet be not prepared to say that compulsory vaccination ought to be established for the good of the community. The pros and cons here are altogether of a different order.

I do not know of any other question arising out of these statistics which has been so fiercely debated as that of vaccination. There has been an analogous discussion, however, with regard to the utility of Pasteur's remedy against hydrophobia, and there is no doubt that mortality statistics will be more and more used in connection with such questions as to the public health. Those who are interested would do well to

refer to the report of the special Commission, appointed by the English Government in 1887, to report upon the Pasteur remedies. It will be seen, I think, from this report that the statistics on the subject were most properly handled by the Commission, and that no doubt is left practically as to the value of the remedies which Pasteur invented. Considering how much the question of anti-toxins generally is engaging the attention of the medical profession, we must recognise that one of the uses of statistics is likely to be the testing on a large scale of the value of specific remedies which the profession may invent from time to time against specific diseases. The question is, here, one of average results derived from a mass of observations, and the proper instrument of the profession in this work is undoubtedly the statistical method.

Coming to the question of emigration and immigration statistics, it may be observed here that the data are not quite so good as those in the case of births, deaths, and marriages. The data as regards emigration have been very largely, in this country at least, statistics arising out of the records devised by the Government for the special purpose of regulating emigration itself and preventing certain abuses which had arisen in the movement of large populations oversea from one country to another. That the records thus obtained have become useful afterwards in establishing the balance of population does not alter the fact that they are not, in their original nature, complete, and that although they are

trustworthy up to a point, they do not give a complete view of the whole business. The so-called emigration statistics from this country are, in fact, a record of the outward-bound movement of passengers from this country, not to the whole world but to places out of Europe. It is much the same with immigration statistics. The immigration which is officially taken note of is the inward-bound movement from places out of Europe to this country. To get a complete view of the whole subject it has been necessary privately to obtain information as to passengers travelling between this country and the Continent, both ways, supplemented as to the passengers arriving at some ports by what are called "alien lists" derived from an old Act of Parliament dealing with aliens, and by no means intended to have any bearing upon statistical results. Nevertheless from these data, designed for different purposes, it has been possible to establish a balance of movement of population outwards and inwards from year to year, which can no doubt be made use of in connection with the population statistics and with the statistics of births, deaths, and marriages.

CHAPTER IV

IMPORTS AND EXPORTS—SHIPPING

By a natural sequence statistics of production and trade would seem to follow those of the statistics of population itself. The most interesting question to mankind, the most indispensable question, is the way in which they obtain their living, and as a matter of fact the statistics of production and trade are found to constitute a great part of the whole field of statistics.

Among these, again, the most important have come to be the statistics of the foreign trade of a country, the imports and exports. With these in a country like England the statistics of the shipping by which the imports and exports are moved are necessarily connected. It is difficult to give a strictly logical reason for this excessive importance assigned to statistics of foreign trade. Before trade itself, that is, the exchange of goods, we must have the production, and in the final stage we must have consumption, trade therefore occupying an intermediate place between production in the first instance and consumption in the last instance. It is obvious,

again, that foreign trade can only be a portion of the whole trade of a country. But if there is no logical defence for the importance thus given in statistics to the foreign trade of a country which is only a part of the whole trade, while the trade itself is not so important as the production and consumption of a country, we are bound to take facts as we find them, and there is no doubt a good historical reason for the large place which the statistics of the foreign trade of countries take up in the whole field of statistics. One reason is that statistics of imports and exports are specially important to a Government in connection with its taxation. In many stages of economic development the most convenient method of raising an income for the State is the imposition of duties upon goods coming into or going out of a country. It is important, therefore, for the State to keep a strict record of such goods, so as to secure the duties which are actually levied and also to secure information regarding possible duties. Another reason, no doubt, is that information is obtained regarding imports and exports with comparative ease. For many purposes Governments must keep guard over the frontiers, and in keeping this guard a record of the goods passing out and in is easily obtained, while no such convenient arrangements are made by which note can be taken of the internal trade of a country. There is no doubt, moreover, that at one time these statistics were especially considered from the point of view of the long exploded mercantile theory, when Governments, as a rule, were very

anxious about the balance of trade and about the state of trade being such that there was a continual influx of precious metals into the country. Looking at the matter more soberly now, it seems also to be obvious that, especially in a country like England, the foreign trade is a fair index of the general state of trade in the country, and the statistics of it supply a great deal of information both as to production and consumption. Better means of obtaining the information might have been devised if the work had been undertaken deliberately from the very beginning; but, as a matter of fact, the statistics of the foreign trade have been used in the way described and have been relied upon to a large extent, and consequently they have come to be of very special importance. In addition, in this country, where shipping is so important a business, the statistics of the two together, interconnected closely as they are, must command a great deal of attention.

It is proper then, in dealing with the statistics of production and trade in a work like the present, that we should begin with the statistics of the foreign trade; that is, of imports and exports and shipping. The order may not be quite logical, but we cannot shut out what is the actual practice in dealing with statistics.

Leaving shipping aside for the moment, we find that there are two primary objects, between which it is difficult to distinguish as regards relative importance, in these statistics of imports and exports. One of these has been already referred to, viz., that

of giving information to Governments as to one of the main sources of revenue or possible revenue. The other is to give information to people in trade with regard to their own current business. The former use speaks for itself, but the latter may require some explanation. Statistics of imports and exports are employed so much in public discussions and in a great variety of ways which are known to students of political economy and to public men, that one of their actual principal uses has come to be rather overlooked. Still, it is all-important for those who use them and study them at all, to keep in mind that there is a main use of them which is constantly going on and without which, perhaps, much less attention would be given to them, even in the other ways which have been referred to, than is now the case. Statistics of imports and exports, then, are used in the first place by people who are importers and exporters of particular goods in order to understand what is the whole course of the trade in such goods. Merchants who send cotton goods or woollen goods or coal, or any other article to a particular foreign country, desire to see what is the course of trade in that article, so as to compare what they are doing themselves with the whole movement in the trade, and also to have some idea as to the general state of the market for their goods. Similarly, merchants importing goods follow very carefully the question of what other goods of the same kind are imported, and from what places. To a large extent also producers who use imported goods in their business are not merely desirous of

observing the particular goods in which they specially deal, but what happens also in like goods or in articles which may be useful to them in some kinds of manufacture, though they are not the main articles of their own business. More generally, bankers and others who have a general interest in trade frequently get a great deal of information from the records of imports and exports as to the ebb and flow of trade in given directions.[1] These practical business uses of the statistics of imports and exports are also daily and continuous. Among the publications issued at different ports is one called a "Bill of Entry," which is practically an official publication, issued daily and, in some cases, weekly at each important port, showing what are the imports and exports that are going on from day to day. Through an office called the "Bill of Entry Office" those desiring to obtain them are also supplied with special returns giving information in such form as they may desire, daily, weekly, or monthly, or yearly, with reference to the trade in particular articles so far as the customs records enable these particulars to be given. The subscriptions for the Bills of Entry and for these pieces of special information amount to a large sum annually, and the fact that such payments are made

[1] Many years ago I knew of a banker who observed a great increase in the bills in the Levant trade, presented for discount in Lombard Street, while there was no such increase in the imports and exports from and to the Levant. On inquiry, he found that the new bills in the Levant trade were really finance bills designed to provide funds for the construction of the Chatham and Dover railway, which was obviously a piece of most useful information the trade returns had put him on to.

shows the value to business men in the first instance of those particulars of imports and exports which are afterwards summarised and made available for general use in what are known as the official statistics.

While these are the main uses to which the statistics of foreign trade are turned, they are, of course, now used very largely by the Government and public men for the information they give respecting the general course of the foreign trade of the country, partly with a special eye to that trade, partly as an indication of the course of trade generally, and partly as throwing light on the more general questions of the production and consumption of the country. It would hardly be possible to enumerate the various uses to which these statistics are, in fact, turned.

One of the most familiar of these uses is the information derived from the imports of certain articles of food and drink as to the general well-being of the country. This is especially the case as to articles of tropical production, such as tea and coffee; and it is also the case as to non-tropical articles, or only partly tropical articles, like wine and tobacco, which are largely consumed in this country but not produced. In these cases the record of imports, not perhaps from year to year but on an average of years, becomes a record of the consumption of the country, and when this record is converted into a record of the consumption per head, certain light is undoubtedly obtained from it as to the wellbeing of the masses of the community.

The same information is also obtained regarding other articles, such as spirits, where the particulars as to the consumption of the country have to be completed by similar particulars, which are obtained from the Excise authorities, respecting the home production. It is also possible to make use of information as to agricultural products which are imported from abroad and compete with similar articles produced at home; allowance being made for the production at home, it is possible to see how far the total consumption of the country absolutely and per head increases from year to year. The imports by themselves in this latter case are not enough to give the information, but combined with the information otherwise obtainable as to home production, they give all the information that can be required. It need not be pointed out that information as to the latter class of imports is specially useful to the agricultural producer at home.

Similarly, the information as to the imports of raw material, cotton, wool, oils, seeds, iron-ore and many other articles, throws an obvious light on the course of production in the country which uses these raw materials.

As regards exports, again, it becomes known that certain classes of exports represent in some cases the greater portion of what is produced at home, in other cases a very large part, so that by following the exports a good idea can be obtained as to what is the production in the country itself, and whether the employment of the people in certain directions is

being maintained. The fortunes of Lancashire, for instance, as regards its textile manufactures, can be read almost exactly in the exports of cotton goods, principally to British India and the East. In the same way the fortunes of our coal-mining industry are reflected to some extent in the figures of the export of coal. The export is, no doubt, merely a fraction of the whole production of coal in the country, but it is especially important as an indication of the state of trade generally, as it is largely exported for the purpose of carrying on the manufactures of other countries, and for consumption by English people abroad, very largely for consumption in English steamers calling and coaling at different ports.

Another use which is continually made of these statistics is that of showing changes in average prices of leading articles. No doubt those connected with trade in any particular article are familiar enough with its varying prices. They do not require the information given by such average returns. Public men, however, have not the same familiar knowledge of market prices, and they also wish to see not merely in detail what is the price of a particular class of goods, but what is the general variation in the average price of the class to which the goods belong. In other words, what the change in price is upon a great scale. The average price of coal exported, for instance, is to public men much more useful than a set of market quotations or extracts from price lists as to varying qualities of coal, which are more or less

bewildering except to people connected with the trade itself.

The statistics, again, become useful after a series of years in showing the ups and downs of trade, and the tendency for good years to follow each other in succession, and for bad years also to succeed each other, so that there have come to be what are called "cycles of trade," no doubt cycles of a somewhat irregular character, but still periodical movements which have to be taken note of. The figures are also indispensable in showing the course of trade in particular articles, such as cotton, coal, sugar, silk, and many others, where the information they give is perhaps not sufficient by itself, but is extremely useful in connection with all the other information in existence respecting the particular trade.

Another use to which the figures are put is the discussion of that question of the balance of trade which has already been referred to, and for which undoubtedly the statistics were more looked at in past times than for any other purpose. The nature of the discussions thus arising will be referred to afterwards. At present we are merely enumerating the kinds of uses to which the figures are put. The same may be said of the use of the figures for such continual discussions as are going on regarding the effect of particular government measures upon trade. In this country for many years these discussions have related chiefly to the controversies between free trade and protection, but they are not exclusively used for such controversies. Any action of Government in interfering

with trade falls to be criticised to some extent by the statistics, and various questions arise as to the limits within which the statistics can properly be used.

The statistics of shipping movements, again, are especially important. They not merely serve to check questions that may arise as to the volume of foreign trade, for which the values of the goods imported and exported, owing to changes in the value of the money itself, are not a perfect test. The figures here are also specially important, because they relate to one of the largest industries carried on by a country like England. To show the whole field of this industry, it is necessary to look not merely at the movements of shipping to and from the United Kingdom, but at the movements of shipping in the trade of almost every country throughout the world. Still, the movements of shipping to and from the United Kingdom constitute a very large part of the whole employment for our shipping, and must therefore always be studied with the greater interest. The importance of this industry, it need hardly be said, is not merely to be measured by the numbers of people employed and the capital employed in the actual industry itself. The numbers of people employed and the capital employed in the building and repairing of the ships are here equally important. Whatever may be the case with other countries then, the records of the imports and exports, and the records of the movements of shipping are especially important in England, on account of the great importance of the shipping industry.

A certain portion of the trade dealt with in these import and export statistics is usually kept apart, viz. the imports and exports of bullion and specie; but it must be understood that in speaking of imports and exports generally, we ought to include the figures as to bullion and specie as being among the most important of all. When the distinction was made, and bullion and specie were kept apart in the accounts from other imports and exports, the idea seemed to be that bullion and specie consisting of the precious metals were not, in the ordinary sense of the word, commodities at all. They were supposed to be, according to the mercantile theory, set against and opposed to commodities. But in fact in the trade of England the precious metals are exactly in the position of any other commodity. Like oils and seeds and other articles of raw produce, gold and silver are brought into this country from the places where they are produced, are smelted, assayed, and treated here like many other commodities, and the products are then distributed over the world, the trade in the precious metals being thus a trade like any other. No doubt the precious metals are also moved about to some extent in connection with changes in the money market, which is another reason why the imports and exports of the precious metals should be specially observed, but in the main the imports and exports ought to be looked at clearly as part of the general trade of the country. The information given by these imports and exports is, no doubt, most important to those who make a special

study of the production, consumption, and movements of the precious metals, and of the various questions connected with the money market in which these facts as to the precious metals have to be considered.

We come then to the question of the data for these figures as to imports and exports and movements of shipping, which are the subject matter of these foreign trade statistics. Here again we find that the data are, on the whole, most trustworthy. In this country the foundations of the statistics are documents handed in by the parties concerned to the customs authorities at the time when ships arrive and goods are delivered, or when ships go away and goods are put on board of them. When a ship comes in or goes away it must be entered and cleared at the custom-house, a rule existing, I believe, at every port throughout the world, and the documents connected with these entries and clearances, which show the capacity of the ship, are the foundation of all the statistics of shipping movements. The captain of a ship when it arrives also makes a report of its cargo, and similarly when a ship goes away the captain has a manifest showing what cargo is on board. In addition, however, as regards the goods imported and exported, the merchants themselves hand in particular documents to the custom-house, which documents are eventually compared with the captain's report or manifest; and these documents of the merchants are the proper basis of the import and export statistics. They may be verified and checked by the customs authorities, and are verified and checked in many ways, but

the documents are themselves the foundation of the figures which are afterwards built up. The important point to notice is that these documents being compiled by the customs authorities, largely for administrative purposes in connection with customs duties, supply what are called "contentious" figures, especially as regards dutiable articles. They are prepared by people who know what the articles are which they wish to have authority to land, and, on the other side, by people who know what the goods are which they are sending away from the country, and there being no motive to tell untruths regarding them, they would necessarily be fairly trustworthy, even if they were not checked by a superior authority. The check of the customs authorities, however, at least in this country, is a very powerful one, and the result undoubtedly is that the figures are built up from a substantial foundation of fact. Complaints have frequently been made that the basis is not trustworthy, because the task of clearing goods at the custom-house is left very much to some subordinate clerk in a merchant's office, but those who make such complaints are probably not aware of the means of checking which are possessed by the customs authorities, or of the pressure put upon the subordinates in the merchant's office not to make mistakes, and so cause trouble to their superiors.

If the documents at the custom-house contained no particulars except the description of the goods and the quantities of them, no question would perhaps arise as to the truth of what has been said. The documents,

however, according to the practice which now exists, also contain a declaration of the value of the goods, and these declarations, it is said, are not so trustworthy as other parts of the entries. The clerks in the merchant's office who make the declarations, it is alleged, have no means of knowing the value of them, and they are merely concerned to put such a value into the declarations as the custom-house officer will probably pass. It is obvious, however, that as regards the great majority of entries it will be much easier for those concerned to tell the truth than to make a false return. In the cases, moreover, where the merchant's clerk tries rather to fill in a figure which will pass unchecked at the custom-house than to fill in a true figure, it becomes evident that there is a real superintendence by the customs authorities, and as they have power to call for invoices, a desire must, on the whole, exist amongst the merchants who give authority to their clerks to pass the entries, to see that the clerks have sufficient information not to make mistakes which would cause trouble. In this question of statistics, besides, it has to be considered that even if the values put upon the goods entering and leaving the country are not so much the values stated in the invoices one way and the other, as the values obtained from price lists applied to goods of the description stated in the invoice, yet still the values so obtained will probably be good enough for the purposes for which they are used in the statistics. It is impossible in these figures to state the actual amounts which goods

imported realise to the importer on the one side and the actual values which the exporter ultimately obtains from the goods which he sends away. These figures would be necessary if an exact balance were ever to be stated between imports and exports, but as an exact balance is not possible, the approximate balance to be arrived at by stating the value of goods imported and the value of goods exported at approximate average market prices is probably as useful as any other value which could be obtained. The figures in the invoices one way or the other are no better than the market values, seeing that they may not correspond to the amounts actually realised. The important matter is that when the figures come to be used afterwards the source of the information should be understood, and that the balance established should not be considered to be exact to a fraction, but should always be treated as merely an approximate balance. The reader will understand that in compiling the statistics of the trade of the United Kingdom, hundreds of thousands of entries are dealt with, and in such a vast field it need hardly be said that there is great room for one error compensating another, so that in spite of much error in detail the general results may nevertheless be sufficiently trustworthy.

Before passing from this subject of the mode of valuing imports and exports, it should be understood that the practice followed in the United Kingdom is by no means universal. Until a comparatively recent period the practice most generally followed was that

of official values. At a particular date it was laid down by the authorities having charge of the statistics that a certain value was to be put upon each commodity according to its description, and so the values that came officially to be published did not even pretend to be the actual market valuations of the goods at the time of import and export, or any approximation to such market values, but were simply artificial computations which may have been more or less true at the time when first instituted, but which had no guarantee of being true at any time afterwards. These official values were found to furnish a convenient index number for showing the changes in the aggregate quantity of the exports from year to year, but in detail they were necessarily incorrect. Such a plan had obvious defects, and in course of time it has almost generally been disused. In lieu of it the most common plan that has been followed is that of appointing a commission of experts who, year by year, assign values to the quantities of goods imported according to their experience of the changes in market values from time to time. This is the plan now followed in France, Germany, and some other important foreign countries. The defect is that in the publication of the periodical returns before the end of a year the values very commonly assigned are not the actual or supposed actual market values at the time, but the market values as ascertained for the previous year. The periodical returns, therefore, until the end of the year do not reflect the changes in market prices that may be going on in the slightest degree, and then

these periodical returns themselves are not consistent with the final publication after the end of the year, when the new market values have been assigned to the quantities. It is maintained, however, for this method that the final results are more trustworthy than the values resulting from the declarations of merchants themselves, which are the foundation of the values in the English import and export statistics.

Another very common feature in the valuations of imports is that they are not the values taken at the place of import, but the values as at the place of shipment. In connection with the imposition of import duties which are frequently levied *ad valorem* different countries have found it expedient to specify distinctly in what way the value of such goods is to be stated, and they have found it convenient to require that the value should be that actually specified in the invoices from the place of shipment. For the purpose of duties it is obvious this is a very convenient plan, as the amount of the duty can be increased or diminished and the basis continues to be quite definite, but of course the value thus shown is not and does not pretend to be the actual value of the goods at the place of import at all, a point which may be important afterwards in dealing with such a question as the excess of imports over exports, or the excess of exports over imports.

The system of declarations of value by the merchants, it may be stated, appears to have had an accidental origin. Down to the beginning of the

present century, or nearly so, nothing but official values appear to have been thought of. During our great wars with France, however, at the end of last century and beginning of the present century, a special charge was levied upon goods exported to repay the expense of convoys which were provided for the ships conveying the goods, and in levying this charge it was found impossible or unsuitable to make use of the official values for the purpose. Consequently merchants were required to make a declaration of the value which could be made the basis of an equitable charge. In this way the system of declared values for the exports from Great Britain arose, and for many years afterwards the returns of the exports were published with one column for the official values which were still continued, and another column for the declared values. As regards imports, however, nothing but official values were published down to the year 1854, by which time, as the official values had been settled as long ago as 1692, they had come to be rather inapplicable to the actual values. In 1854 there was a change, and for some years in this country the plan followed was that now followed in France for both imports and exports, viz., that of a commission of experts to settle the values. It was not until 1871 that the present method of declarations by the merchants which had long been in use for the exports was finally applied to the imports. I believe myself that the system of declarations by the merchants, which has thus arisen, furnishes the most accurate and useful basis of valuations for both

imports and exports; but the purely accidental origin of the method must be recognised in any discussion as to the relative advantages of this method and others.

Up to a point, then, to bring this general statement to a conclusion, we may say that the data of the returns of imports and exports are fairly good. They are obtained from the people in trade themselves who have the means of knowing the correctness of the information which they give, and this information is controlled by the customs authorities in each country, who have ample means of checking the returns made as to quantities and to some extent as to values. This power of check is especially valuable as regards the imports; the customs authorities have the merchants' declarations in their hands when they take note of what goods are actually delivered over the ship's side, and check these deliveries with the ship's report, or manifest as it is called. The figures are thus contentious figures; that is to say, they are the subject of criticism by two parties, the one having an interest in seeing that they are not excessive, and the other having an interest in seeing that they do not fall below the truth. Especially is this the case with the returns as to dutiable goods imported and with the returns as to certain articles of export which are taken out of bond. In this country for many years the number of articles subject to duty has been strictly limited, but the fact that the whole trade is subject to inspection in connection with the levy of duties also

ensures that to some extent the checks, which are necessarily very strict as regards dutiable goods, are applied to all the goods which come under the review of the officers. The entries with regard to the movements of shipping are also accurate for a similar reason, that they are under the observation of authorities who have a distinct interest in connection with their administration in seeing that the returns are accurate.

While the original documents in import and export statistics are thus trustworthy, it must be understood that there are inherent difficulties in the records as regards many points which have to be carefully attended to when the statistics themselves come to be used in various discussions. This does not throw any doubt upon the trustworthiness of the returns themselves as far as they go; it only affects the question of the extent and character of the objects for which the statistics themselves can be used.

A prominent difficulty of this kind relates to what is known as the country of origin of imports and the country of destination of exports. It appears a very simple matter, at first sight, to say that in the returns of imports we should show the place from which the goods have really come, that is to say, the place where the goods were produced. Similarly, it seems an easy matter to say that the returns of exports should show the place to which they are finally sent for sale. It is found, however, in practice that there are obstacles which are insurmountable to giving this information as a matter of course in the ordinary

returns of imports and exports. As regards imports, for instance, they very often come to this country from intermediate ports, depôts, to which the goods have been sent from their original place of production, and the people who send them to this country or bring them into this country, although they know the depôt port from which they have come, do not know or cannot tell exactly the country from which particular goods have come to that depôt. It is the same with goods exported. The exporter does not always know in what market the goods will be finally disposed of. To give one concrete illustration: an exporter may consign some particular goods to Antwerp, but he does not know or could only learn with some difficulty whether the goods ultimately go to Germany or to Switzerland, or perhaps to some South American or distant country. The difficulty is, indeed, in the nature of the business, and of course it makes itself felt in discussions upon the statistics themselves when a question arises, for instance, as to how much of our foreign trade really is with Belgium or Holland, or perhaps some country which is not mentioned in our import and export statistics at all, such as Switzerland, with which, nevertheless, it is known a considerable exchange of goods takes place.

How the difficulty is actually met in the import and export statistics of the United Kingdom is explained in a note prefixed to the last annual statement of the trade of the United Kingdom with foreign countries and British possessions, viz. for the year 1897. Those who intend to make use of

statistics of the foreign trade of the country for special purposes of comparison, ought to make themselves well acquainted with a note like this:

NOTE

In the tables contained in these accounts imports are generally classified as received from the countries whence they were shipped direct to the United Kingdom. In the great majority of cases the country of shipment is also the country of origin. But it should be borne in mind that this is not always the case, and that to a greater or smaller extent merchandise originating in one country is credited in the tables to other countries at whose ports it has been trans-shipped, or through whose territories it has been conveyed by rail for shipment to the United Kingdom. In particular cases in which this mode of classifying imports appears likely to give a seriously misleading idea of the real course of trade, efforts are made by the Customs Department so far as possible to attribute such imports to the actual countries of first shipment. It is not, however, possible to do this in all cases in the absence of certificates of origin of imported goods. How far it has been found practicable in each instance to make the necessary adjustments in the returns will be seen from the following explanations of the more important cases in which difficulty arises:

1. Switzerland, Bolivia, the South African Republic and the Orange Free State, having no seaboard, do not figure in the returns at all. It has been found impracticable to distinguish merchandise imported from these states, and such merchandise is therefore credited to the country containing the port of shipment.

2. Large quantities of goods from Japan, China, and other eastern countries are trans-shipped at Colombo. Other eastern goods are trans-shipped at Marseilles. Goods from Chili and Peru are largely trans-shipped at Colon and the Isthmus of Panama. In all these cases the goods are, so far as possible, credited to the country of original shipment instead of to Ceylon, France, or the Republic of Colombia, as the case may be.

3. A considerable amount of Canadian produce finds its way to the United Kingdom *via* the ports of the United States in winter, when many Canadian ports are closed by ice. To a limited extent produce from the United States is sent to the United Kingdom *via* Canadian ports in the summer. Where, in such cases, the official documents enable a distinction to be drawn between Canadian and United States produce, it is credited to the true country of origin, but in many cases such a distinction cannot be made, so that in using the statistics it should be remembered that a certain amount of the trade of Canada with this country, especially in winter, is unavoidably included under the heading "United States."

4. A considerable amount of the produce of Germany, Austria, and Switzerland finds its way to this country *via* Belgium and Holland. Some Russian produce comes through Germany. Much West Indian produce is imported after trans-shipment at United States ports. In none of these cases has any correction of the returns been found possible, and the whole of the produce is credited to the country containing the port of shipment.

Exports are, as a rule, credited in the tables to the country of ultimate destination as declared by the exporters in their entries. Exports, however, to Switzerland, Bolivia, the South African Republic, and the Orange Free State, which possess no seaboard, are credited to the country in which the port of discharge is situated.

Another obvious difficulty inherent in the subject arises in the designation or classification of the goods themselves. It is not sufficient that importers and exporters when they pass goods into the custom-house should give the name by which they themselves would describe the goods. When the statistics come finally to be published it will be quite impossible to put into the accounts every name for commodities which merchants would thus supply. Confusion

would also arise unless the matter is attended to, from one name being given for the goods in one year and another name to the like goods in another year, or even from one merchant giving one name to certain goods and another merchant giving another name to the same goods or the same kind of goods. There are also almost infinite varieties and sub-descriptions of goods which it would be ridiculous to attempt to give minutely in general returns. To attempt to give the figures with such minuteness would be to prevent people seeing the facts at all. People would not be able "to see the wood for the trees." The result necessarily is, however, that when the statistics come to be used it is always necessary to remember that varying qualities of goods and, even to some extent, different goods in reality, are properly entered by the same name in these import and export statistics. To take an extreme illustration, books are entered for export properly enough under the single designation of "books"; and the unit of quantity taken is the hundred-weight. But we all know what different commodities are included under the generic term of books. How little the designation in reality tells us as to what kind of literature is imported or exported! It is the same with the imports and exports of paper. It is only of late years that a distinction has been made in the returns between wall-paper and paper for stationery, but it need not be said that the differences between different kinds of wall-paper are themselves enormous, and the differences between different kinds

of paper for printing newspapers or books and for stationery purposes generally, are also enormous. On a larger scale these differences are exhibited in the great groups of imports and exports. The varieties of different corn imports, for instance, are very great indeed. The varieties of raw cotton and of wool, and of all other raw materials are also equally considerable. Coming to the exports we find that both as regards cotton and woollen manufactures, the general classifications of the exports really cover an immense variety of different exports,—different trades. The goods sent to any one locality probably differ in some important particular from goods entered under the same designation sent to a different locality. The consequence is that the figures can only be used afterwards with the utmost discretion, because real changes of trade in making comparisons from year to year, or in making comparisons with different countries, may be concealed under these general designations.

Another inherent difficulty arises from the changes in the value of goods themselves. Such are changes by which in one year goods entered under the same designation may really be of quite a different average value from goods entered in a previous year, because of the intrinsic changes which have been going on in the trade. The proportion of the different qualities imported and exported may be, in fact, quite different from the proportion established in a previous year. In addition, when comparisons come to be made, it is found that the values are always changing from an

immense variety of causes, and consequently the general total of the imports or exports of a particular class of goods, when compared with that of a previous year, may supply no trustworthy inference as to whether the trade is diminishing or increasing. The change in the nominal amount of exports, for instance, may be merely due to some change in the value of the raw material contained in the goods exported, and not to any change in the amount of production in the country from which the export is made.

Another special difficulty arises with reference to the entries of some special articles. I refer especially to difficulties in connection with the entry of the precious metals. On account of the small bulk of gold the quantities imported and exported may easily escape observation, while there has been a special cause of error, I believe, at different times owing to the practice of the trade in sending gold from one place to another under the description of silver, for the sake of evading the higher charge for freight. There is even a greater difficulty in the matter of diamonds, which may pass through the post, and for which there is no heading in our own import and export statistics at all, but information with regard to diamonds coming from the Cape, for instance, is supplied in a special way for publication in our import and export statistics by the authorities at the Cape. The statistics of the movements of the precious metals again are liable to a defect caused by the great movement in gold which

undoubtedly takes place in the pockets of travellers. Possibly and probably only a small margin of the actual movement, as a rule, is really concerned with the amounts passing in the pockets of travellers, but at certain times, and with reference to certain questions which arise as to the movement of the precious metals, such as questions relating to the actual gold circulation of the country, I am satisfied that an important difference is made by these movements which are entirely unrecorded. While the balance of imports and exports would appear to establish one conclusion as to the amount of the gold circulation in the country, we find that another figure would be established if it were considered that against the import of sovereigns which undoubtedly takes place from certain continental countries, there could be set the export of sovereigns which had really taken place in the pockets of tourists, which sovereigns had been spent upon the Continent, had gradually found their way through the money-changers of the Continent back to this country, and coming in large quantities appeared in the returns of imports.

No doubt other difficulties arise as regards a few articles through the unwillingness of merchants to give true particulars, because they wish to conceal facts from their rivals in trade. The fact that the figures are eventually to be published thus becomes a reason for their not being so good in some details as they might otherwise be.

Difficulties also arise, no doubt, in connection with smuggling operations in some countries, where it is

desired to conceal the movements altogether from the authorities, and where in consequence there is no doubt the returns are considerably vitiated. But apart from smuggling I do not think that, generally speaking, there is much error in the returns of imports and exports arising from the unwillingness of merchants to give information.

There is another cause of possible error in the changes of destination which may occur in the course of a voyage. A ship may leave this country, for instance, quite properly entered as clearing for a certain other country, and the goods it conveys may be correctly entered as shipped to that country, but, as a matter of fact, the ship does not reach its destination. It may be lost on the voyage, or it may be diverted by the outbreak of war to some other place, or for some other reason it may be sent by its owner to another place. The returns of exports therefore, which were originally quite correct are, in fact, disturbed by events subsequent to the shipment. I do not find that this cause of disturbance does, in fact, affect, even by a small percentage, the returns of exports from the United Kingdom, but I am not sure that the returns of the exports of other countries are not, as regards some goods, very largely affected by the change of destination which occurs during the voyage. In the grain trade especially it is the practice to have a ship coming from the Black Sea, or from the United States, or from South America, directed to call at Queenstown or some port in the English Channel for orders, or to

report itself at a certain lighthouse or coastguard station for the same purpose, and then the ship is sent either to London or to Antwerp or to Hamburg, or to some other continental port, as the case may be, to discharge its cargo. Goods, therefore, which were properly entered at first in the exports of the country sending them as goods exported to Great Britain, become in fact in the course of the voyage goods exported to some other place, so that the original entry, which no doubt remains in the statistics, is actually falsified by the event. This is a material matter, I believe, sometimes, in comparisons which may be instituted between the returns of different countries, and which help to account for the fact that the exports from country A to country B in the returns of A do not correspond precisely with the same exports when they come to be described as imports in the statistics of country B. The change of destination on the voyage is one cause of the difficulty of making the two returns coincide. And yet both returns in one sense of the word may be strictly accurate.

It may be repeated again, however, that all these difficulties in dealing with the data of import and export statistics are inherent in the nature of the subject, and do not affect at all the accuracy of the statistical data themselves. They merely raise questions as to the limits of usefulness in handling the statistics for purposes of discussion.

Another special difficulty arises in the classification of the imports and exports. A great deal is made

in the returns of some countries of the distinction between articles of food, articles of drink, raw materials, manufactured articles, partly manufactured articles, and so on. It is found in practice, however, that no such classification can be made with anything like complete satisfaction. Articles of food and drink, it is plain, might equally well be described in strict economic language as articles manufactured and partly manufactured. To all intents and purposes, an animal which has been fed and reared with difficulty, or with the application of scientific ideas to its feeding and shelter, as well as an animal of a particular kind which has been brought into existence by scientific breeding, is as much a manufacture as any other. Economically it is not a simple product of the soil, almost in a state of nature, such as we often think of when we speak of agricultural produce, but it is a highly artificial product to which the method used in manufacturing has been applied. It is much the same with what is called raw material, like coal, produced in this country. The coal is, in fact, produced by highly artificial processes of the nature of manufacturing, and by processes in which a large amount of machinery is used. Even very highly manufactured articles again, such as cloth of different kinds, become the raw materials of very extensive industries in a country like England. The distinction, therefore, which is drawn in many statistical publications, is a popular one and not a scientific one, and when it is reasoned upon as if it were scientific and complete, it becomes a very dangerous distinction,

and the consequent classifications are full of pitfalls. They can only be used when it is remembered that they are popular and not scientific.

Coming to the question of the special controversies in which these statistics have been used, we find that perhaps the most important of all is that of the balance of trade, which has, in fact, appeared so important at different times that the statistics themselves, it may have been supposed, were invented or devised for the purpose of discussions of this question. The origin of the controversy is as old as the mercantile theory itself. In former times people raised all sorts of questions upon the import and export statistics, and approved the balance of trade between this country and others, according as it appeared that the trade was one which brought cash into this country, and not one which was the occasion of cash being sent away. The controversy in its older forms appears very strange, but we must always remember that at one time trade was looked at from this special point of view, and the tradition of the controversy remains. In modern times the form of question raised is usually as to the whole amount of the imports into the country and the exports from it, and the balance thence arising. But one frequently sees references, nevertheless, to the trade between this country and some other particular country, such as the United States, in which the fact of our receiving so much more from the United States than we export to it is dwelt upon with emphasis, as if it were, in fact, necessarily a danger to this country to

carry on a trade which left us in the end with so large a balance to settle.

Still, the mercantile theory in its applicability to trade with particular countries has been sufficiently exposed; and it is quite unnecessary to discuss it now. Every one is more or less familiar with the idea that there is no necessary connection between our imports from a particular country and our exports to it. The modern idea is that one country imports what it wants from another and pays for it by exporting to all other countries, the balance in favour of one country being settled by bills which are obtained in its dealings with other countries where the balance is a different way. Our debt to the United States, for instance, is no doubt paid in large part by our exports to South America and other countries, from which the purchases of the United States of coffee, tea, and other articles are larger than its direct exports to those countries. Our exports, moreover, may and do, in fact, include a large amount of the raw material which the United States has sent to us, so that to a certain extent we are not the final importers but are merely intermediaries in passing farther on the goods which the United States sends to us in the first instance. I refer here especially to such an article as raw cotton, which we no doubt buy from the United States ultimately to send away again, and which is, therefore, very properly paid for by us to the United States through the transfer of the claims which we have upon the countries that are the ultimate receivers of the goods. But while the mercantile theory is

thus exposed as far as trade between any two single countries is concerned, the question of the whole balance of trade, which was also part of the mercantile theory, remains, and there is much shaking of heads and controversy over the fact that we receive annually so very much more than we send away.

The way in which import and export statistics can be used in this controversy, therefore, becomes important. I discussed this subject at great length in the year 1882 in a paper then read to the Statistical Society, and more recently I have returned to the subject; but the main points may be stated here. They are, first of all, that imports and exports themselves are only a part of the whole account between nations. There are other very important items which enter into the account; and there are three items especially important in dealing with the import statistics of countries like England. One of these items is the earnings of the shipping fleet of England, the cost incurred in getting these earnings being, in truth, quite in the nature of an export as far as the question of the balance of trade is concerned. If we send a ship to carry goods between one port and another, the people who sail the ship and who convey the coals which are put on board of it, are as much exporters in the proper sense of the word as the people who send away cotton goods or machinery and other articles for sale abroad. The service which the shipowner renders has, in fact, to be paid for as well as the commodity which the merchant exports, and the two are, for purposes of an account of the balance of trade,

clearly to be put in the same category. Questions may arise as to the amount which ought to appear in the general balance, but there can be no question as to the logic in dealing with the matter. Next, there is a similar credit to us of an amount not quite so easily ascertained in respect of the commissions earned by this country as an exchange and clearing house for settling the monetary transactions of the world. Last of all, the account cannot be stated exactly without some estimate of the sum which a country like England is entitled to receive in respect of interest and profits upon its capital abroad. Here again there may be difficulty in arriving at an exact statement of the amount, but the logic is undeniable. Other matters come in when such an account is gone into carefully. At times it is quite possible capital may be coming home from other countries. At other times we may be exporting capital for investment. There are also minor items which may be omitted from the import and export statistics, and which affect the balance less or more one way or the other, such as the amount of coal put on board steamers for consumption in their voyages to and fro, the numbers, specially interesting to us, of ships built for or sold to foreigners, and the like. But the main corrections in the balance of an account in a country in the position of England are undoubtedly those that have been stated.

A country may be in the position of having a balance of trade "in its favour," its exports may be more than its imports. The question will clearly then arise whether the excess of exports is real or

not; that is to say, whether the mode of valuing the exports and imports is such as to give a true balance. Suppose a country to value its imports at the place of shipment and not at the place of arrival, while the exports are valued at the place which they leave: then it is quite possible that an apparent balance of trade in favour of that country may be shown just because the whole value of the imports which it has to pay for does not appear in the account. Assuming the excess to be a real one, then the question will arise how far that excess is due to the fact of the country in question lending capital to other countries, or how far it is due to the necessity of remitting interest on capital that has been previously borrowed. There is no doubt that in former years in this country, when there was an excess of exports, we were lending money to foreign countries and setting up a permanent condition of things which now leads to our having an excess of imports because commodities are sent here in payment of interest due to us. On the other hand, we have countries at the present time like India and the South American countries, the United States, Australasia, and others which are beyond question in the position of being permanently indebted. In such cases the absence of an excess of exports would rather require to be remarked upon than otherwise, as showing that for the moment the countries in question were not paying the interest which they owed, but were really borrowing again. The main point always is that imports and exports are merely items in a general account of the

indebtedness between countries, and the balance of trade so called is consequently not to be taken as showing in itself anything for or against the economic welfare of the country concerned. A great deal besides this one fact of the balance of trade has to be considered.

Another discussion in which the statistics of imports and exports have been greatly used, especially in the United Kingdom, has been the controversy on the policy of free trade or protection. As we have seen, one of the uses to which such statistics can always be put is that of serving as materials for criticising any trade policy which a government may adopt. If a particular measure is adopted by a government for the purpose of developing trade generally or developing a particular trade, then the statistics of imports and exports can afterwards be referred to to determine in point of fact whether the whole trade or the particular trade in question has developed as the Government anticipated. The statistics may not be final in the matter because other influences may have come into play, increasing or diminishing the trade as compared with what it was before the Government measure was adopted, and these influences have to be allowed for before the statistics can properly be used. Still, a government would, no doubt, be in a difficulty which had promised a particular result as the consequence of the trade measures it had adopted where that result did not appear certainly to have followed. To explain that the result had in reality followed, but that the effect was obscured by

other influences, is not an easy matter. This has been felt in the application of statistics to the controversy between free trade and protection. The disposition has been amongst the controversialists to cite every increase of trade after the adoption of a free trade measure, or of a protectionist measure respectively, as if it were a proof that the measure in question had been a success. The opponents of a given policy, on the other hand, have been disposed to quote every failure of trade to increase after a certain measure as if it were a proof that that measure had failed. Nothing could be more illogical. What is to be done is to isolate a particular cause, to allow for all the other influences that were in operation, and then to show that this particular cause must have made the difference. Very little of this careful reasoning will be found in the controversies between free traders and protectionist politicians.

The main use of statistics in this controversy, I believe, will always be of a negative description. As I pointed out in the paper which I read in '82, which has been already referred to in connection with the topic of the balance of trade, the logical position of the question is such that the *onus* of proof falls entirely upon the protectionist. It is the protectionist who suggests an interference with trade in order to increase the welfare of a community beyond what it would otherwise be. It is for him, therefore, to prove that the interference he has recommended has answered the expectations formed

of it; and for that purpose he must show not merely that some improvement of trade in a particular direction has followed the measure, but that the welfare of the community is greater than it otherwise would have been. In the nature of the case he cannot be in a position to prove this. To show the result of a particular measure, perhaps a very small one when compared with the total wealth and resources of a community, and in the midst of thousands of changes occurring from other causes, may be described as a material impossibility. The protectionist in this way never can have statistics to prove his case, and as the appeal is to statistics and to statistics alone, the verdict of impartial minds must therefore be given against him.

The mystery is how statistics come to be so much quoted at all in the controversy, and it will be found, I think, that they are mostly quoted in an entirely illogical manner. The fallacy of *post hoc ergo propter hoc* is one that is most continually repeated in these discussions, and that is all that can be said.

Another discussion in which the figures are frequently used is that regarding the well-known question, "Does trade follow the flag?" There is an impression among many people that the trade of a country is increased by its having colonies and dependencies, and appeal is frequently made to the statistics of imports and exports to show this. The main facts relied upon are that these statistics show that in British colonies there is a larger amount of

trade per head with Great Britain than there is in foreign countries, and it is also affirmed that over a particular period there has been a greater increase in the trade with British colonies than in the same period with foreign countries. It seems desirable to point out, then, that there is some defect in this logic. It is quite clear that to prove the benefit of possessing a colony or dependency by a country like Great Britain, you must not merely show that the colony or dependency in question does a larger trade with Great Britain than any foreign country does, but you must also show that there can be no other cause for the difference than the difference of the flag. It may be quite possible that Great Britain, with one or two of its colonies, may have a larger trade in proportion than it has with any foreign country, and yet that this may arise from some natural cause connected with the trade itself; such, for instance, as the colony producing an article of which it has almost a monopoly, the case with Australia to some extent, especially in former years, as regards gold and wool; the case with India as regards such an article as opium or jute; and the case with various tropical countries in former times as regards an article like sugar. These countries being able to export articles of this sort were in a position to be purchasers of such goods as they required, and which Great Britain happened to be able to dispose of. Hence trade arises, but the cause of its arising is not the flag, it is some entirely different cause. We can see at the present time, in fact, that countries which have a

different flag, like the Orange Free State and the Transvaal, really develop an immense trade with Great Britain, just as much as if they were actual colonies. At any rate, whatever the facts may be, it is quite plain that no sufficient inference can be drawn from the mere evidence that Great Britain does more trade in proportion with some colonies than it does with certain foreign countries, or with foreign countries in general.

Much the same remarks apply to the other proof alleged as to trade following the flag, viz., than in a given period there appears to be a greater increase in our trade with colonies and dependencies than in our trade with foreign countries. A good many years ago, when there appeared to have been, in a short time before, an increase in the proportion of our trade with colonies and possessions from about 24 per cent of our aggregate foreign trade to 30 per cent, many people were disposed to urge with confidence that a sufficient proof was thereby given of trade following the flag. Those who were acquainted with the facts over a long period, however, were aware that all along there had been great fluctuations from period to period in the proportion of the trade with our colonies and possessions to our total foreign trade, the fluctuations being usually between 24 and 30 per cent, and they were not disposed to accept as final a particular oscillation merely. Their wisdom has been proved by the event, for in the last few years the proportion of our trade with foreign countries, as distinguished from colonies and possessions, to our

total foreign trade has again increased, and appears once more as something like 75 per cent. There is no logic, however, in the argument in any case. The proportion of our trade with colonies and possessions to our total foreign trade, it is clear, might change from many other causes besides the fact that they are colonies and dependencies.

Another discussion in which import and export figures have lately been used is in the question of the alleged progress of one country at the expense of another in its foreign trade. I refer particularly to the alleged progress of Germany. As to the bare facts of the case, the statistics are very properly used. If it is found that Germany or some other country, when proper comparisons are made, is increasing its foreign trade, and that a country like England is not increasing it, or at any rate not increasing it in so great a degree, the facts are certainly of a kind that ought to be stated. The facts as to the branches of trade in which the foreigner is increasing and in which there is no such increase in our own foreign trade, are also facts that are deserving of careful statement. Where the statistics have been wrongly used, however, is in the continual insinuation that accompanies them that the progress on the one side and the smaller progress on the other are due to our failure in a competition, and that the whole change is necessarily one to be greatly regretted. The insinuation apparently proceeds from an imperfect survey of the whole facts. As regards this country especially, the review of the foreign trade appears to

be incomplete in two ways: first of all in making no allowance for the effect of the fall in prices of raw materials which we import, and which enter more largely into our exports than they do in the case of any other country; and, second, in the omission of all reference to the enormous business which we do as a ship-owning country, in which capacity we have a set-off to the falling off of our business in other directions. At the same time there is a total omission of any consideration of the question of the simultaneous development of our home trade, although this may be after all the most potent reason for the non-development, or the smaller development, of our foreign trade itself. The true history of our trade, both absolutely and in comparison with that of foreign countries, allowing for all the causes at work, has yet to be written.

These are a few instances of discussions which have attracted a great deal of attention, in which the statistics of imports and exports have been used. It would be impossible, however, to enumerate the various discussions on this head of more or less importance. Almost every trade may give rise to controversies at one time or other. The great iron trades, the coal trade, the cotton trades, the woollen trades, and so on, have each a history and development of their own with a great bearing on the general question of the prosperity of the country. The point for a student is always to remember the logic of the statistics. Very frequently the statistics are more suggestive of matters for inquiry than conclusive as

to any superficial point which they may appear to prove; and in such matters superficial conclusions are always to be distrusted.

So far we have dealt with imports and exports generally, and with the statistics of the movements of shipping as more or less incidental to them. A few words, however, may be added with special reference to the statistics of shipping. What may be said then is that the figures as to the movements of shipping, the entries and clearances of vessels in the foreign trade, indicate the volume and direction of that foreign trade like the import and export statistics themselves. They are a rough check also on these import and export statistics. It is quite clear that in a country which carries on its foreign trade over-sea, there can be no increase of a genuine character in that trade generally without a corresponding increase of the shipping business, and the trade in a particular direction will not diminish or fall off without a corresponding change in the shipping business in the same direction.

The data as to the shipping movements are also extremely definite. The entries and clearances of ships at the custom-house are definite facts which can be easily recorded, with a note of the tonnage of the ships, whether they are sailing-vessels or steamers, what nationality they possess, and from and to what countries they proceed. Up to a point everything seems very easy in these figures.

I should point out, however, that the business is

perhaps a little more complicated than it seems. The distinction between ships that are sailing and steam; the distinction as to nationality; the distinction as to whether they are in cargo or in ballast; and the distinction as to what countries they come from and go to, all make the account of ships much more elaborate than would at first sight be thought. A ship in this sense is not one article, but many, as there are so many varieties of ships which have to figure in the returns.

Besides these obvious complications there are inherent difficulties of a more serious kind to be considered in any use of the statistics:

1. Ships may clear for a particular port in some foreign country and then be diverted on the voyage to another foreign country and port. This does happen, as we have seen, in the case of ships from the Black Sea and other foreign countries coming to Queenstown or the Channel for orders, but there must be many other cases, so that the record of the voyage which may appear at the custom-house which the ship leaves may not be consistent finally with the actual voyage itself. A more serious matter is that the same ship may enter and clear from and to more places than one, and the difficulty of making a record which shall be true as to each place is not an easy one. When comparisons come to be made as to our shipping business from and to particular countries it may sometimes be important to remember that one particular port or other may not have full justice dealt to it in our own returns, through its being omitted as not

being the first or the last port to which a ship is cleared.

2. Ships may arrive at and clear from more than one port, and this occasions some serious practical difficulties. It is now well known in this country that many mail-ships arrive at and sail from Plymouth and Southampton as well as London. How are these ships to be entered? If they are entered as arriving at both Southampton and London, say, or else clearing from both London and Southampton, then the effect is that when the tonnage of London and Southampton and other like ports is added together to make up the totals for the United Kingdom, the total is larger than the reality, because there is a duplication at the ports. On the other hand, if the entries are made at one port only, then injustice may be done to the magnitude of the business at the other port at which the ship has also arrived and from which it likewise sails. The solution given to this puzzle in England, I believe, is that the ship on arrival is entered at the first port where it discharges any cargo, and not at any subsequent port, and the ship when it clears is entered at the first port which it leaves and not at any subsequent port. But it is not quite clear that the subject is adequately treated in this manner, although it has long been customary in this country. Clearly a difficulty may arise in dealing with the shipping statistics of another country for comparative purposes where a different practice prevails in that country. I am inclined to think that some of the big figures which we get from China, for

instance, are due to the fact that ships entering at more ports than one are credited at each port, and then the total is added together to make a very large figure.

3. Records of tonnage of ships entering and clearing are apt to become very largely nominal when the ships are making regular trips to and from different ports, often calling at some with very little business. This may give rise to some mistakes when comparisons are made between shipping business at the present time (since these regular liners increased in number) and the shipping business of former times.

It seems unnecessary to add anything as to the special discussions in which the statistics of shipping movements as distinguished from those of import and export statistics may be used. Here the statistics of shipping are undoubtedly for the most part ancillary to the principal statistics of the imports and exports. There has been one important subject for discussion, however, in connection with shipping statistics in past times. This is as to the proportion of national ships and of foreign ships engaged in the foreign trade of a particular country. There was great anxiety in this country at one time, and there may be in other countries still, as to whether the foreign trade was being done by ships of the country or by foreign ships. The whole policy of our navigation laws and the whole policy of navigation laws in foreign countries appears to depend very much on the notion that a country should carry on its foreign trade as much as possible in its own ships. The

question is no longer of living interest to us, because of the immense and unmistakable development of our foreign shipping. But it may at least be referred to as one that has excited a great deal of discussion in past times.

Shipping as a branch of production and employment remains to be dealt with. It cannot merely be looked at in connection with import and export statistics. We find, in fact, that a considerable amount of shipping is employed in what is called the coasting trade of the country, while other ships, not merely boats but ships, are engaged in the business of fishing. Still more our fleet of ships is engaged in all parts of the world as well as in conveying goods between the United Kingdom and other countries. In other words then, shipping as a branch of production and employment is much more extensive than the shipping which is engaged in the foreign trade between the United Kingdom and other countries. At the same time the business of ship-building, with which the shipping is connected, is much more extensive than it would be if ship-builders had merely to build for the mercantile fleet. The ramifications on this head are accordingly somewhat extensive. It would be a little out of place, however, to do more than to refer to them, especially as one of the more important of them has already been glanced at in connection with the subject of the balance of trade, viz., the earnings of our fleet and its general business in carrying on the foreign trade not merely of this country but of other countries. It may be sufficient

to mention in addition that there are full statistics as to the number of ships engaged in the foreign trade, partly in the foreign trade and partly in the home trade, and solely in the home trade respectively, along with figures as to the number and different grades of people engaged, from all of which a more or less complete account of what may be called the production of this immense fleet can be drawn up. In connection with wages statistics also, a full account can be given of the employment in this fleet. But it does not seem possible at this point to do more than give a reference to show that the subject is not overlooked.

Another branch of the shipping statistics must also be referred to here, though it may be dealt with more fully afterwards. I refer to the wreck statistics. Economically the subject of wrecks has a good deal of importance, as it is part of the waste of ships which has to be paid for out of the freights that are earned, and the record of wrecks is, of course, all-important for the business of marine insurance, just as corresponding figures with reference to births and deaths are important for the business of life insurance. The loss of life among crews of ships in our mercantile fleet is also a subject of obvious social interest. Wreck statistics have also to be studied, and I believe were primarily studied for the purpose of showing the places where wrecks for the most part took place, the dangerous parts of the coast or of the ocean; and also for such purposes as bringing out what were the dangerous ships either from age or

structure, or overloading or insufficient manning, or other causes. In this way statistics of wrecks would almost require a chapter by themselves to be fully treated, and it is impossible to do more than merely mention the fact of their existence at the end of this long chapter on import and export statistics.

CHAPTER V

AGRICULTURAL STATISTICS

Proceeding with the statistics relating to production and trade we come to the statistics of what is the largest single industry, if not absolutely the largest, in almost every country, even in the United Kingdom. It might be more correct to speak of agriculture as not one industry but many—at any rate a group of industries. Still, the different members of the group are so connected that there is no unfitness in speaking of the whole as one, and that one of primary importance, even in a country like the United Kingdom where so many other industries are largely developed.

The object of statistics in this branch of production is, in this country at least, primarily the information of those interested. It is a matter of comparatively recent history that the Government were asked between thirty and forty years ago, on behalf of those concerned in agriculture, to prepare and publish official statistics. Complaints had been made, for instance, that while it was possible to form estimates as to the variation in yield per acre of the

crops of wheat from year to year, yet this knowledge was not quite so useful as it would otherwise be, because there were no accurate accounts of the number of acres under wheat. If the trade, it was said, could only get from year to year information as to the number of acres, then it would be possible for those concerned to make a fair estimate as to the aggregate changes in the harvest yield. Similarly, information was desired as to the live-stock, so as to give some means of estimating the amount of dairy produce, the amount of wool produced, and other particulars. It does not seem to be the case in other countries that agricultural statistics arose out of any special demand like this. In most continental countries the agricultural statistics really had their origin in the *cadastre* which has already been referred to in connection with the statistics of area and population; the Government required agricultural information from the beginning, for the sake of its land revenue. In new countries, again, like the United States and the Australasian colonies, the demand for statistics appears to have been coincident with the growth of the countries themselves, the bulk of the people being engaged in that business, and therefore being concerned to know about it. Generally the information given by agricultural statistics, in whatever way they be given, is required for the trade, and that is the main use to which they are put.

There is equally no doubt, however, that information as to agriculture is largely required for the use of the Government and of public men, because it is

so important to them to know what is going on in a branch of production which gives employment in most countries to the majority of the population, and which in this country gives employment to large numbers. The value of the land, of course, depends very largely upon the agricultural production, and even in a country like England, where agriculture to some extent is less important than it is elsewhere, the rating of land makes it important that the whole question of agricultural production should be carefully followed by public men. The wonder is that on this account agricultural statistics did not come to exist in this country even sooner than they did.

In Ireland, it may be mentioned, the origin of agricultural statistics has been somewhat different from the origin in Great Britain, to which our previous remarks have referred, and has resembled more the origin of statistics in continental countries. The Irish Government being in its essence a government from above, like the powerful administrative governments of the Continent, the authorities have long felt that information as to agriculture and the condition of agricultural peasants and labourers throughout the country was indispensable for the operations of government; and, at any rate since the police force was established more than sixty years ago, care has been taken to obtain through the police numerous particulars as to the agricultural condition of the country.

While the statistics have reference to production it may be noted that, to a very large extent, at any

rate in this country, they do not ostensibly deal with production itself, but rather relate to data which can be used for estimating the amount of production by those interested. The particulars desired are in the nature of a census of the acreage under crops and a census of the live-stock, and, with some exceptions to be stated, does not go beyond this point, while the census is undoubtedly the most important and critical part of all the statistics that are obtained. This census, it may be observed, is now made annually in England, but for the purposes for which it is required it is plain that the practice in many countries of a census at frequent intervals may be quite sufficient. On the assumption that the particulars are not likely to change very much from year to year, a census as to these particulars would enable those concerned to make the necessary estimates as to production without the variations in acreage under particular crops from year to year being exactly recorded.

As far as this census in Great Britain, and likewise in Ireland, is concerned, it may be considered that the data for it are quite sufficient to ensure accuracy. The practice in England is for the Government Department having charge of the matter to send out each summer, through the officers of Inland Revenue of each district, schedules which are to be filled up by each occupier of agricultural land in the country. These schedules are delivered to the occupiers by the officers of Inland Revenue, and after a sufficient time are called for. Ultimately then, the particulars which are filled up in the official statistics

are derived from occupiers who have at least the means of knowing what are the correct figures. And it may be assumed that as there is no motive for telling falsehood, the particulars as a rule are correctly filled up. In addition, the officers of Inland Revenue being in a position to have local knowledge are able to check the returns which are received, comparing each individual return with returns that have been given in previous years, and with the returns made by neighbouring occupiers, which would reveal at once any great discrepancy in the proportion of crops or live-stock returned by an individual occupier compared with those of his neighbours. A certain proportion of occupiers do not make the returns, as they are not compulsory, but in these cases the particulars are filled in by the officers of Inland Revenue themselves, according to the best information they can obtain, and any inaccuracy resulting from this neglect of the occupier in special cases must have a very small effect upon the final totals. In Ireland the officers of the Government do not proceed in quite the same manner, and are directly responsible for the results obtained, but the local knowledge of these officers in Ireland must be even greater than the local knowledge of the Inland Revenue officers in Great Britain, and there can be no doubt of the substantial accuracy of the results obtained.

In addition, of late years the Government in Great Britain has made special attempts to add to the information an estimate of the yield of the crops themselves. It is unnecessary here to give a minute

description of the method by which this result is obtained. It will be sufficient to say that estimates are required in a great many cases from experts in different parts of the country, and it is from local particulars thus furnished as to the estimated yield in different localities that the final estimates are built up. As the estimates of the local experts are themselves carefully supervised, a good deal of value may be placed upon the estimates of production thus obtained as a supplement to the census of the acreage under crops itself. The department does not make any calculation with respect to the annual yields of meat and dairy produce, which are no doubt matters of intricate calculation, but various calculations are made by agricultural authorities from time to time, which are no doubt of considerable value. It is quite clear that agricultural experts in each locality have the means of calculating the average number and weight of cattle slaughtered in each year, and the average price, while similar calculations can be made as to the yield of milk by cattle and the average price. At present, however, on these latter heads there are no formal and official statistics.

Among the agricultural statistics there also fall to be included statistics as to the diseases of cattle, which are, however, not so much statistics as records of cases of disease, such as the foot and mouth disease, the cattle plague, tuberculosis, and the like, designed for the purpose of guiding the immediate administrative action of the department, so as to stamp out the diseases altogether.

Connected with these agricultural statistics also, are the records known as the corn returns, which are returns of the quantity of corn sold in the chief market towns of England, with the aggregate price realised by these sales. These returns relate to the sales of wheat, barley, and oats, and have furnished for many years a series of prices known as the Gazette average prices of corn. As an adjunct to the principal agricultural statistics they are no doubt very useful, but it should be understood that they were not instituted originally for the purpose of benefiting agriculture, and have not been continued officially for that purpose. Originally, towards the end of last century, they were in fact instituted for the purpose of enabling the Government of the day from time to time to decide as to the opening of the ports for the importation of corn from abroad. This opening depended upon the question of price, and therefore the local prices were obtained to enable the Government to decide when foreign corn should be admitted. Originally twelve different sets of prices, according to the difference of the coast localities, were required, and it was only later that they were all consolidated and one Gazette price published. In 1836, when the sliding scale of corn duties, which made these prices essential, was about to be abolished, a new use was found for them in the regulation of the tithe, under the Tithe Commutation Acts. Under these Acts the tithe, which till then had been all generally payable in kind, was made payable in future in money, but the amount of money was

determined by considering the amount of tithe payable for each property to be so much wheat, barley, and oats in equal quantities at the par price of the seven years preceding 1836, after which date the amount annually payable was varied according to the changes in the Gazette average price. For many years accordingly the object of the corn returns has been treated as if from the beginning it had been designed to regulate the tithe, whereas no such object was in view primarily. The prices have been now so very long established that they are useful, quite independently of the special objects for which they were intended or for which they have been used, and quite independently, it may be added, of any special agricultural object whatsoever.

Coming back to what we may call the principal statistics, we need hardly point out that there are very obvious pitfalls in compilations derived from them. Although the units of acreage and the units of the number of live-stock are superficially alike, it is quite obvious that the same nomenclature may cover very different things. An acre of wheat, for instance, will vary from county to county, and will even vary on the average from year to year, apart from the natural changes in harvest yield, according as there are a greater or less number of acres under the crop. The larger the number of acres, it may be assumed, the smaller will be the average yield permanently, because the increase of the number of acres would imply that under the stimulus of good prices, soils of inferior quality were being brought

into cultivation. When cultivation is diminished again, it may be assumed that it is the inferior soils, the less productive soils, which go out of cultivation, and so the average yield of what remains is greater than the average yield of the larger acreage which has been under cultivation before. Similar remarks obviously apply to all the crops. The varying qualities of live-stock also need not be enlarged upon. There must be the greatest difference between the quality of the cattle in the county of Aberdeen and the quality of the cattle in other counties where the meat produced commands a much lower price than that of Aberdeen cattle. There must be the greatest difference also between the average value of sheep which produce high-priced wool in abundance and of sheep where the wool production is small and inferior, while there are similar obvious differences as regards the meat-producing capacity of the sheep. Variations thus arising may not be of very great importance in the agricultural statistics of one country from year to year, but over considerable periods points like these would have to be inquired into and allowed for by those making a study of the subject. They are of obvious importance also in making comparisons between the agricultural statistics of different countries. The live-stock of a country like Russia, for instance, is not likely to be at all comparable with the live-stock of the United Kingdom, where attention has been given to breeding for generations, and where the feeding and housing of cattle are carried to a pitch of perfection which is not at all likely to exist in so

poor a country as Russia, without the markets which the agricultural produce of the United Kingdom possesses. It need hardly be added that in the crop estimates which have been referred to there is the utmost difficulty in obtaining figures that are really trustworthy. Results can be obtained, I believe, by the exercise of great care on the part of those interested, but outsiders will have great difficulty in making use of such estimates. Students must be careful to follow the methods practised, and judge of the logic for themselves.

It is not the object of this book, as has already been explained, to give an account of the various branches of statistics which have been referred to in detail, or to exhibit results such as would be found in a dictionary of statistics or a year-book. It may be convenient, however, by way of illustration, to show some leading facts as to the agricultural statistics of the principal countries, so that the use to be made of the statistics in public discussions can be understood.

The following short table exhibits, for instance, the proportions of the soil of England given up to different crops in 1898 :

	Acres.	Percentage to total.
Corn crops . . .	5,731,463	17·71
Green crops . . .	5,321,662	16·44
Permanent grass . .	13,254,349	40·95
Railways, residential, etc., waste, mountain, and heath land . . .	5,946,131	18·37
Woods and plantations (1895)	1,665,741	5·14
Small fruits [1] . . .	63,438	0·20
Flax	895	0·00
Hops	49,735	0·15
Bare fallow . . .	335,948	1·04
Total area (excl. water)	32,369,362	100·00

[1] The acreage of orchards in 1898 was 220,220 acres, but it is also accounted for in the acreages in the table under the heading of the crop or grass grown beneath the orchard trees.

It will be observed from this that the amount of land under crop in this country is really comparatively small; that large deductions have to be made from the total area in dealing with the soil of England for agricultural purposes, because the soil, though it produces something, is really not used to a material degree in agriculture, and then after that the greater portion of the soil is not used in cropping, as it is popularly understood, but is really used as pasturage or for the production of grasses. If we compare this with the agricultural statistics of a country like France, we see at once that there are very noticeable differences. In France there is a much larger acreage under the plough and much less absolutely waste land. But there is at the same time a much greater pro-

portion of woods and plantations, and so on. The following is a table for France in 1892 similar to that above given for England:

	Acres.	Percentage to total.
Corn crops	37,412,571	28·66
Green crops	15,656,777	12·00
Meadows and pastures	15,347,207	11·75
Moor and heath land	9,629,369	7·37
Woods and forests	23,518,273	18·03
Orchards, kitchen and market gardens and nurseries, etc.	3,264,419	2·49
Industrial crops (colza, flax, hemp, olives, tobacco, hops, sugar beet, etc.)	1,312,825	1·00
Vines, bearing and not bearing	4,447,208	3·40
Fallow	8,317,769	6·37
Uncultivated mountain, marsh, and bog land	5,749,318	4·40
Building lands, railways, roads, rivers, etc.	5,901,546	4·53
Total area	130,557,282	100·00

Going further afield, we find that in new countries like the United States and the Australasian colonies the proportion of land under crop, as it is in England, is very small, but the agriculture is altogether of a different character, being what is called extensive and not intensive. It would be needless to multiply statistics, however, the object rather being to exhibit the different nature of the problem which has to be dealt with in other countries, and the difficulty of establishing genuine international comparisons.

In another way, viz. by comparisons over long

periods, statistical facts of interest can also be brought out. One of these is the diminution of the arable area in England, and particularly the diminution of the area under wheat. Beginning with 1870, which is the date when the agricultural statistics were fairly established, we find that the total acreage under corn crops, and the total acreage under wheat in particular, were diminished as follows:

	Total acreage under corn crops.	Total acreage under wheat only.
1870	7,570,279	3,247,973
1875	7,528,543	3,128,547
1880	6,993,699	2,745,733
1885	6,569,105	2,349,305
1890	6,281,494	2,255,694
1895	5,718,997	1,339,806
1898	5,731,463	1,987,385

Almost the entire reduction in the acreage under corn crops, it will be seen, must be due to the reduction of the acreage under wheat, which is a great and conspicuous fact, implying remarkable changes in the economic and political condition of the country. Similarly, there has been an increase of the acreage under pasture, but not so much through the absolute diminution of the acreage under crops of all kinds as through the addition from time to time of land reclaimed from waste to the total under pasture.

With regard to live-stock again, it is found when comparisons are made for European countries over a long series of years, that there is an absolute diminu-

tion in the number of sheep, but there is an increase in the number of cattle, showing, no doubt, the working of a set of influences upon agriculture generally which affects all the old countries of Europe:

CATTLE.

	Millions in or about 1870.	Millions in or about 1898.
United Kingdom . .	9·2	11·1
France	11·3	13·4
Germany	15·8	18·5 [4]
Austria	7·4	8·6 [5]
Hungary	5·3	6·7 [6]
Italy	3·5 [1]	5·0 [5]
Belgium	1·2 [2]	1·4 [6]
Holland	1·4	1·6
Denmark	1·2	1·7
Sweden	2·0	2·6
Norway	1·0 [3]	1·0 [7]
Russia in Europe (excluding Poland)	21·4	32·9 [7]
Total . .	80·7	104·5

[1] 1875-6. [2] 1866. [3] 1865. [4] 1897.
[5] 1890. [6] 1895. [7] 1900.

[TABLE

SHEEP.

	Millions in or about 1870.	Millions in or about 1898.
United Kingdom . .	32·8	31·1
France	24·6	21·3
Germany	25·0	10·9 [4]
Austria	5·0	3·2 [5]
Hungary	15·1	8·1 [7]
Italy	7·0 [1]	6·9 [5]
Belgium	0·6 [2]	0·2 [7]
Holland	0·9	0·7
Denmark	1·8	1·1
Sweden	1·6	1·3
Norway	1·7 [3]	1·0 [8]
Russia in Europe (excluding Poland)	46·5 [6]	49·6 [9]
Total . .	162·6	135·4

[1] 1875-6. [2] 1866. [3] 1865. [4] 1897. [5] 1890. [6] Including goats. [7] 1895. [8] 1900. [9] 1900, including goats.

A table like this, it need hardly be said, after what has been stated above, is always subject to the observation that the units at the beginning may not be the same and are probably not the same as the units at the end of the period. We may consider it as quite certain that there has been a great improvement in the average quality of both cattle and sheep in the interval between the first year and the last. The increase in the meat-producing capacity of European agriculture must accordingly be much greater than what appears from the figures superficially, and the diminutions in the mutton-producing capacity and wool-producing capacity are probably

much less than would appear from the figures, owing to the improvement in the quality of the sheep. But the effect of the table, as far as it shows the different course of the history as between cattle and sheep, remains. There has been a great change in agricultural conditions in Europe generally during all these years.

These are merely illustrations, however, of the use to which agricultural statistics can be put, and are no more than a fraction of the information which can be derived from them, and of which it would be quite hopeless to give a *precis* in a work like the present.

The kind of questions where these statistics are of use has already been partly indicated in the above illustrations, but one or two topics which have actually come to the front in the discussions may be referred to. One of these is the probability of the approach of a period when the production of food may be insufficient for the growing numbers of the human race. A problem of this kind in relation to it was stated by Sir William Crookes in his address to the British Association in 1898. In this address, which naturally gave rise to a great deal of comment, on account of the distinction of the author as a man of science and his position at the time as President of the British Association, the theme was that probably by the year 1930 there would be an insufficient supply of wheat if present conditions continued. Not more than a certain quantity of land throughout the world was properly available

for wheat production; and allowing for the acreage under other crops according to the kind of agriculture prevailing, the number of acres that could be under wheat, at a certain given date in future, might be stated with approximate accuracy. From these data Sir William Crookes arrived at the conclusion of a probable insufficiency in the wheat supply at the date mentioned. He then went on to suggest that the only way in which the deficiency could certainly be made up was by the application of nitrates to the soil; that the nitrates actually in existence in some parts of South America would in fact be exhausted before very long, and that the human race must therefore rely upon the exertions of chemists in recovering nitrogen from the atmosphere, so that in the development of chemistry he found the solution of the problem as to how the wheat consuming peoples of the world were to be supplied with wheat.

It would be unsuitable here to enter into a minute criticism of this speculation. Our object now is rather to inquire into the methods of such speculations than to state the results. As regards method, however, it will be obvious that the assumption made as the basis of the speculation that the proportion of the area under wheat to other crops is to remain substantially the same, is itself a very large assumption. It can only be dealt with properly by those who are experts in agriculture, but without being experts we may recognise at once that in such a business as agriculture very large internal changes must always be going on, and that in fact the

agriculture of different parts of the world is very different. More particularly there is an obvious difference between the agriculture of old countries, which is generally what is called intensive agriculture, and the agriculture of new countries, which is generally and naturally called extensive agriculture; that is, requiring the use of a very large amount of land in proportion to what is highly cultivated for crops. One cannot but see that as the agriculture of new countries comes to resemble more and more the agriculture of old countries, the production per acre will steadily increase, and in this way the proportion stated by Sir William Crookes both as to the extent of area and of wheat, and the average yield per acre, will change considerably.

The nature of the problem stated by Sir William Crookes with special reference to wheat, is, however, of general interest, and it may be the case that if his methods were to be applied to the production of meat, for instance, it would be found that very considerable changes are probable in the near future in this department of agriculture. The increase of land under permanent pasture, which is one of the features of agriculture in this country, brings with it as a consequence not an increase but rather a diminution in the number of cattle, so that if the number of cattle and the production of meat are again to increase in a country like England, a considerable increase of the land under the plough must also take place. In new countries a reverse process may take place for a time, permanent pasture taking

the place of the large tracts of unreclaimed or more or less unoccupied land which now exist. But eventually, to all appearance, the time will come when, in order to increase the production of cattle and dairy produce, the land under the plough must also be increased and the permanent pasture diminished.

Going further afield, we find the problem of an approaching insufficiency in the food supply presenting itself in a very acute form in India. In that country the population has increased at the rate of rather more than 10 per cent in ten years, which upon the population of India at the present time would add to that country some 30 millions of people in ten years.[1] At the same time, according to the acreage statistics of the Government of India itself, there are no more than about 100 million acres of land to be taken up, and in a very few years the whole of this acreage must be absorbed, while it is doubtful whether in reality so large an acreage is really available. Unless, therefore, in India a very great improvement takes place quickly in the capacity of the people for agriculture, the question of an insufficiency of food, which has really been intimated from time to time by the great famines which take place, will become one of chronic importance. Already it is stated by Indian officials that during the last ten years the price of the common food of the people has increased, while the wages that they receive have not increased, and this would be one of the symptoms of an approach-

[1] In the last decade the increase was not quite so great, but it is still large.

ing chronic famine, such as the agricultural statistics appear to foreshadow.[1] We may exclaim *absit omen*, but there is no use shutting our eyes to facts of this kind when they occur.

Other topics will not fail to occur to students of political economy as to which light will be sought from agricultural statistics compiled with population statistics themselves. Among these is the great question of small holdings *versus* large holdings, which system of agriculture, it has been argued extensively, is most conducive to the welfare of the State and to the welfare of the population engaged in agriculture itself; how far again does the system of small holdings really obtain in different States? The issues here raised, however, are so extensive that, apart from any other reason, I forbear going into them. One of the points which must be kept in mind, however, is that all such questions must be treated historically. It may be the case that the system of agriculture in each country has had a more or less natural evolution, and that however much certain results may be desired or regretted, it is not in the power of governments to vary these results by special measures of any kind. Apparently the condition of things which has existed in England, of owners of land holding large amounts of land on one side, with the land in turn actually farmed in large quantities by occupiers with considerable capital, and under the occupiers again a mass of labourers on weekly or daily wages, without any right of ownership or occupancy

[1] See Mr. O'Connor's evidence, Indian Currency Committee, 1898.

in the soil itself, is very singular. But if the singularity has been evolved in a natural manner, the resulting condition of things may not be one that can readily be changed. The system of agriculture must always be difficult to change in any case, owing to the necessity of equipping the land with farm buildings which may be suitable for one class of occupation but would not be suitable for another class of occupation. The historical student should be careful to note in any case whether the conditions which appear so singular, when England and Scotland are compared with the rest of the world, are not to some extent being repeated in different places elsewhere, where the general economic and industrial conditions of England are also being repeated.

Before passing from the subject of these agricultural statistics we must also notice that, apart from the interest of these statistics to the trade of agriculture and people who are engaged in that trade, as well as to the public in connection with the supply of food, the statistics are also of interest to manufacturers and others in connection with the supply of raw materials. In this country we think of the agriculture as being carried on for the production of food and nothing else. But even in this country we must recognise that there is also a considerable amount of raw material for manufacture produced. The wool of sheep, for instance, the hides, horns, and other parts of animals, a crop such as flax, and a crop like hops, all show that agriculture not merely supplies food, but even in this country supplies very consider-

able quantities of raw material for different industries. This is more conspicuously the case with the agriculture of many foreign countries. In the United States, India, and other countries, for instance, cotton plays a great part. In India jute also plays a considerable part, and there is also a large production of seed oils in India. In new countries generally, again, the production of cattle and sheep is very largely carried on for the hides, tallow, and wool, although of late years even in new countries the production of meat itself for export to old countries has also become important. Statistics on this head, however, belong more naturally to the general statistics of those trades in which the raw materials are used, and do not raise the special points of interest which have been discussed, arising out of the agricultural statistics in relation to the food supply of the world.

As already intimated, the question of the returns of the average prices of corn, which in this country fall to be included among agricultural statistics, is one that is really apart from those agricultural statistics themselves. This question, in fact, belongs to the more general subject of prices, and we defer its discussion to a later chapter.

CHAPTER VI

MINERAL STATISTICS

THE next large group of statistics of production which we may take up, is the group of mining or mineral statistics. Such statistics are, of course, of varying importance in different countries, but in all the leading countries of the world, the United Kingdom, France, Germany, Russia, Austria, and the United States, as well as in the leading English colonies, they have a very important place. In the United Kingdom their place is only second in importance to that of agriculture itself. The estimated value of the produce, according to the official returns for 1897, is 82 millions sterling, that of coal alone being 60 millions sterling, and these are the values at the place of production itself, a considerable value being added by the mere cost of transport before the supplies of these minerals take their place upon the market. The value of agricultural produce itself, being usually estimated at about 200 millions sterling, it will be seen that the proportion of the value of our mining industries, in this country at least, even when measured against agriculture, is very high.

The objects for which the statistics here are designed are very much the same as those of agriculture itself. They are for the information of the trade in the first instance, and next for the information of Government and public men as to the resources of the country, the two objects being in practice intermixed, so as to be hardly distinguishable. There is this peculiarity about mineral statistics also, a peculiarity which may have to be noticed in connection with a good many other trade statistics, and with money market statistics, that they originate in the necessities of the people concerned in the trade. Without Government intervention there would undoubtedly be mineral statistics of a kind. We see what the trade does with regard to mining all over the world, in copper, in lead, in tin, not to speak of what is done in the precious metals themselves. Those concerned with the mines, which are very largely on a scale that makes them suitable for public companies, desire to know as regards their own mines, and must know, what the production is. And they have an equal desire to be informed as to the production generally, so as to understand the condition and prospects of the market. The use of Government intervention then very largely is in this matter to check or confirm unofficial figures, and to bring the whole together for purposes of reference. Governments are also interested in other departments of mining statistics, such as the amount of labour employed, but so far as production is concerned, their interest is on all fours with that of the trade itself.

To a large extent the data of mining statistics are necessarily very simple. Mining is an operation which, as a rule, must be carried on upon a large scale, and is in this country carried on on such a scale. As a consequence the number of points at which statistics of production have to be collected is comparatively small, while the business is such that those who carry it on necessarily have a complete record of the work done. As it happens also for different reasons in every country, mines are under close and vigilant inspection by the governments. In this country the motive is very largely humanitarian—the interest of the people and the Government in the welfare of the mining population. In other countries the interest may be more largely of an economic kind, the governments deriving a royalty from the mines and being therefore directly interested in the production. I do not know exactly the precise method in which the statistical information is brought to account, but it is so obvious that the information must exist at each mine itself, that nothing much turns upon the mode of constituting the statistical office of the government by which the information is brought to a focus and published. The point here is that the data are so simple as to make no difficulty in the account.

Mining statistics, however, are not confined merely to the quantities brought to the surface. There is usually an attempt to put a value upon these quantities, and at this stage it is obvious an element of doubt is introduced. Here it would be of some interest to know in what way the values are obtained,

whether the figures are those actually stated by the proprietors of mines themselves, as the result of the sales which they make, or whether they are average values put upon the quantities by Government inspectors and others making the returns, according to what are judged to be the average market prices in the locality. As far as the United Kingdom is concerned, not much would turn upon these differences. The produce of mines is disposed of in such large quantities by contractors with railways and shipping companies and others, that people especially acquainted with localities, even if the mine owners were not very communicative, would soon have a fair idea of the average value of what is produced. Under the system of sliding scales also, which have been so common in this country, those in the trade get to know generally what are in fact the average prices realised. Although, therefore, the values in our mining statistics were formerly most defective, being formed on official values and not actual records, I see no reason to doubt that a fair return is now made. But I am not sure that in all countries similar conditions exist, and that exact particulars as to the values of the mining production can be stated so easily. For comparative purposes it is plain that the value ought to be stated in a similar way and at a similar point in each country, the place that should be chosen by preference, according to my judgment, being the pit's mouth, but this would not alter the fact that in different countries these figures would not represent in the same way the value of the

mining industries to the country, there being good ground in making such an estimate for including the first cost of transport from the place of production to a suitable market.

These are all points, however, on which those who issue mining statistics ought to be clear and explicit, and the returns generally, I fear, are not in fact so explicit as it is desirable they should be.

While the data as to quantities also are fairly accurate, and must be fairly accurate as a whole, for the reason which I have given, the inherent difficulty remains as to the varying quality of articles which go by the same name. Iron-ores, to take a common illustration, are obviously of the most varying qualities. The difference between the iron-ore of Sweden or Bilbao, and the iron brought up in the Clyde district of the United Kingdom, is very great indeed. The difference in coal is even more striking. The difference between cannel coal, the best steam coal, and the various kinds of common coal which are produced in the United Kingdom are prodigious, and then in other countries we find there is a larger production of quantities differing entirely in kind, such as anthracite and lignite, where the burning power in some cases is not more than half the burning power of even the commoner kinds of coal in this country. The differences as to quality have to be allowed for in different ways when the statistics come to be handled in any way for comparative purposes. They do not prevent the statistics themselves being used, as there are frequently broad

results to be brought out which are not affected greatly by these differences of quality. But these differences nevertheless underlie all the statistics, and are never to be lost sight of by the student. Even if the values were better than they are, we should not have in the comparative values a complete measure of the differences in quality which would frequently have to be taken note of.

With regard to the principal facts brought out by these statistics, we have already noticed the extent of the annual production of the United Kingdom in value. The items of this production in 1897 are as follows:

QUANTITIES AND VALUE OF COAL AND METALS PRODUCED IN THE UNITED KINGDOM IN 1897.

	Quantities.	Value. Millions sterling.
Coal . . . million tons	202	59·7
Pig-iron [1] . . „	8·7	21·2
Fine copper [2] . . . tons	518	0·027
Metallic lead [2] . . . . „	26,562	0·332
White tin [2] . . . . „	4,453	0·291
Zinc [2] . . . . . „	7,049	0·127
Silver from lead ores [2] . . oz.	249,156	0·028
Gold (Bar) . . . . „	2,032	0·007

[1] The production and value of pig-iron from ore *raised in the United Kingdom* in 1897 were 4·7 million tons of the value 11·4 millions sterling.

[2] From ores raised in the United Kingdom.

It will be seen from this how preponderating is the importance of coal in the mineral production of the United Kingdom. It is also to be considered with reference to the above table that the produc-

tion of pig-iron stated, includes the production from foreign ores imported as well as the production from native ores; and we learn from the import returns that the iron-ore we receive from foreign countries amounted in 1897 to 6 million tons. The amount of iron-ore annually imported has increased to this figure from almost nothing in the course of the last quarter of a century.

The quantities of coal and certain metals produced in some of the chief countries of the world have been estimated as follows:

ESTIMATED QUANTITIES OF COAL AND METALS FROM NATIVE OR IMPORTED ORES PRODUCED IN THE UNDERMENTIONED COUNTRIES IN 1897.

Country.	Million metric tons.		Thousand metric tons.		
	Coal and lignite.	Pig-iron.	Copper.	Lead.	Zinc.
United Kingdom . .	205	8·9	0·5	60	24
Austria-Hungary . .	36	1·3	1·4	10	6
German Empire . .	120	6·9	20·5	119	150
France . . .	31	2·5	...	10	38
Spain	2	0·1	53·9	189	6
United States . .	182	9·8	227	179	91

The great bulk of the tin comes from the Malay States (46,000 metric tons) and the Dutch East Indies (14,000 tons). It will be seen that as regards coal and iron the United States is abreast of the United Kingdom; and Germany is also a very important factor in these industries. At the same time other countries take the lead in all the other items of mineral production, copper, lead, tin, and zinc. As far as minerals are concerned, with the excep-

tion of coal, we are as much dependent upon foreign countries generally as we are dependent upon them for supplies of food and for the raw materials of our textile manufactures. There is no special reason why the precious metals are almost always kept apart in statistics of production and trade; why they are considered to be something so very special is not clear; but if the precious metals were to be included in a table like this, the general effect would be somewhat changed. The importance of the United States as compared with the United Kingdom would rather be increased, and the importance of Australasia, the Cape, and Mexico, with regard to the mineral production of the world, would also be increased.

With this table we may also connect another, showing the progress or the retrogression of the production of the different minerals in the United Kingdom during the last half century:

PRODUCTION OF COAL AND DIFFERENT METALS IN THE UNITED KINGDOM AT DIFFERENT DATES SINCE 1850.

		1850.	1870.	1890.	1897.
Coal	million tons	65 [1]	110	182	202
Pig-iron	,,	[2]	5·9	7·9	8·7
Fine copper	tons	13,200	7,175	936	518
Metallic lead	,,	64,429	73,420	33,590	26,562
White tin	,,	6,750 [3]	10,200	9,602	4,453
Zinc	,,	[2]	3,936	8,582	7,049
Silver	oz.	674,458	784,562	291,724	249,156
Gold (Bar)	,,	[2]	191	206	2,032

[1] Year 1854. [2] No information. [3] Estimated.

This table shows very clearly how great a transformation in the mineral history of the United Kingdom has taken place in modern times. While coal has increased greatly all through, though not at so great a rate in the last twenty years as before that, we find that pig-iron has made a relatively slight advance, and that almost all the other metals have steadily declined. The decline in copper and tin is especially remarkable. At the beginning of the period copper and tin were still very important industries in the United Kingdom, and the United Kingdom no doubt enjoyed at one time a great advantage from the position it held among the nations of the world as a producer of copper and tin. But all this advantage, whatever it may have been, has left us and the change has come about in a comparatively short period. The subject is not without interest, as we shall see, in connection with the change that is apparently beginning to take place in the production of iron, and the still greater change that is foreseen by some authorities in connection with the production of coal itself.

Various questions of great interest are continually being discussed in the trade in connection with these and the like statistics. Few subjects are more carefully studied by those concerned than the amount of annual production of a metal like copper, and its probable consumption at a given date. So keen is the discussion that those concerned are by no means content with annual statistics, but the production from week to week and from month to month is

studied, as well as the movement of the amounts produced to the principal markets and the withdrawals for consumption from those markets. As every one knows also, copper has been from time to time the subject of extensive speculations. Speculators finding the market at different times in such a state that it will be apparently possible to raise prices artificially by buying and locking up a part of the supply, in other words, making a corner, have on frequent occasions endeavoured to make such corners. I recollect very well an effort of this kind as long ago as 1873, and, in more recent years, the public will not have forgotten the gigantic speculation which entailed with its defeat the downfall of the Paris Comptoir d'Escompte, and many other disastrous consequences. All such speculations are based upon the almost too careful study of what we may term the statistical position of the trades concerned. But apart from these, there is no doubt that the close study of the statistical position generally tends to steady the markets, and to make the oscillations less than they would be if those concerned were without the information which the statistics give them. A shortage of supply is long foreseen, so that those engaged in the production are induced to expand their operations, and, on the other hand, an excessive supply is also foreseen, which is equally a warning to contract operations.

Beyond indicating, however, in what way the statistics are used for regulating markets in the daily course of business, it appears unnecessary to explain

in detail what the more striking operations have been.

The main public controversy which has arisen out of these statistics is that with reference to coal, which has already been alluded to. More than thirty years ago, in the year 1865, Mr. Jevons published an interesting work on the coal supply of England, which attracted a great deal of attention, and which has become indeed, one of the best known of economic books, attaining a celebrity like that of Malthus on population. The thesis was that whereas the amount of coal available in the English coal-measures was a quantity that could be calculated in a definite manner, the consumption of coal in the United Kingdom was increasing at such a rate that if it went on the whole available supply in England would be exhausted in the course of a very few centuries. Before that, as the exhaustion went on, the price would necessarily go up, a great advantage would be given to other nations which had coal more available, more easily worked than we had, and the change of conditions thus foreseen ought to be considered by public men. So great an impression did this book make that Mr. Gladstone specially dwelt upon it in his Budget of 1866, and urged the conclusions of the book as a reason for repaying and extinguishing our national debt at a more rapid rate than had previously been practised. Following on this book came the great coal famine of 1873, which was naturally taken to be a vindication of the forecast itself.

What are we to think of such speculations, which

obviously resemble the speculation of Sir William Crookes with regard to the wheat supply, and the earlier speculation of Malthus with regard to population itself? How far do the statistics really suggest such speculations and throw light upon the solution? It seems to me that the answer must be in favour of the great utility of such speculations themselves. It is a common error regarding them, that those who make the forecast predict an actual famine at a given date in the future. This is not the case. What is described is merely what will happen if certain conditions persist, and the statement of what must happen under these conditions is really adduced to prove that the continuance of the conditions is itself impossible. In this respect the work of Mr. Jevons, as Mr. (now Lord) Courtney pointed out in his address to the Statistical Society in 1897, has been amply justified by the event. The conditions have been changed and are already changing, because the increase of the production of coal in the United Kingdom since he wrote has not been at as great a rate as it was before that date. The figures are:

RATE OF INCREASE OF COAL PRODUCTION IN THE UNITED KINGDOM IN THE UNDERMENTIONED PERIODS.

	Rate of Increase per cent.
1854–60 . . .	30
1860–70 . . .	31
1870–80 . . .	33
1880–90 . . .	24
1890–1900 . .	24

The truth is that there was a wonderfully rapid

increase in the production of coal between 1840 and 1860, which could not possibly have been continued, so great would have been the changes involved in the industrial condition of England and of the world generally. A change in the rate was inevitable, but we must also recognise that other consequences follow from the slower rate of increase of the production of this article.

In connection with this subject the annual return as to coal production and consumption now issued by the Board of Trade deserves to be studied. It is needless to go into the details of the figures. The evidence supplied as to the cheaper rate of production in several countries than in the United Kingdom, particularly the cheaper rate of production in the United States, shows that the conditions which existed at the time Mr. Jevons wrote have entirely changed. It is equally apparent that the area to which British coal is exported for use throughout the world is contracting, and even in some directions rapidly contracting, so that our predominance in the matter is no longer what it was. It is within the range of possibility at least, that in the production of coal what has happened with regard to metals produced in the United Kingdom may also happen, and from having a predominance throughout the world our position may become one of relative inferiority.

A question arises of great economic interest. Lord Courtney and others with no little reason argue that, so far as the commercial eminence of England is due to its possession and working of coal and iron and

other minerals, this commercial eminence seems bound to pass away. They go further, and argue that what has happened in Cornwall in particular, which was the seat of copper and tin mining when these industries were very valuable to England, must now happen to England generally when we are losing our supremacy in coal and iron. With this opinion I do not myself agree. It seems to me that England is not dependent for its position in the world upon coal or iron any more than it was dependent upon copper or tin; that at a given time these industries were greatly developed and England gained by them, but that this is a very different thing from their being essential for all time to England; and that as England still retains its accumulated capital and its industrial and manufacturing power generally, although it draws its supplies of food and raw materials mainly from other countries, it has sufficient elements left for great industrial prosperity. The cost of transport is now so reduced that people do not require to live where their food and raw materials are produced. The question, however, is not one that can be followed to a final conclusion here. It is enough to indicate the nature of the question raised for discussion, and how essential the statistics are in suggesting it, and in preparing, up to a point, the necessary solution.

CHAPTER VII

FISHERY STATISTICS

ANOTHER branch of production which attracts attention at this point is that of fisheries, which is always associated in economics with other branches of primary production, such as agriculture and mining. I have been a little doubtful, however, whether to deal with it in a separate chapter or not, because when we look at the figures and compare fisheries with the other great branches of primary production, we find it to be of very small relative importance. The fisheries of the United Kingdom, for instance, which are among the most important, produce no more than about 7½ millions sterling of fish annually, which compares with about 200 millions sterling, the produce of agriculture, and with 80 millions sterling produce of mining. Looking at the matter also as a question of food supply, we find that while the consumption of food in the United Kingdom at wholesale prices is between 400 and 500 millions sterling, the extent to which fish enter into that consumption, deducting from the production in the United Kingdom what is exported, and adding the net imports from other countries, is only about 8 millions sterling. In other countries,

such as France and the United States, the facts are found to be much the same, and although Canada, Norway, and Holland appear to be cases of countries where the fishing industry is of greater relative importance, the products being largely exported, yet still the aggregate is not very great, and not large enough to make fisheries take rank with other branches of primary production. In spite of the small relative importance, however, fisheries are a subject of special interest for historical reasons. They are the subject of innumerable international controversies, engagements and treaties, of which we have an illustration at the present day in the continuance of the controversy between France and England respecting the Newfoundland fisheries. Great importance has also been attached to the subject in books of political economy, partly in consequence of the supposed importance of fish as an article of food, and partly in consequence of the political and social value ascribed to fisheries as nurseries of seamen.

Even if the value of the produce of fisheries was to be stated so as to include not merely the value of the fish as taken from the sea and landed—which is the value put upon the produce of fisheries in the English returns, whatever may be the case elsewhere—but also to include the value of the fish after the cost of curing and preparing them for the market, in some cases, and the cost of conveyance to the market, we should still have a very small sum for comparison with the value of agricultural production and the value of mineral products. Dealing then with these fishery statistics,

we must draw special attention at the outset to the fact that only sea fisheries are included. The question of fish in rivers and the value of the produce thereby obtained is an entirely different one, and the two subjects ought not to be mixed up. The river fisheries are obviously an element of much less importance as regards value, but the trade also is necessarily totally different, and the subject has not had the same historical interest as that of the sea fisheries, because there has been no question of using them as nurseries for seamen. There is one kind of fishery, that of salmon, which is carried on mainly in the estuaries of navigable rivers, as to which there may be some doubt whether the produce of the fishery ought not for the most part to be included with that of the sea fisheries. But on the whole, looking at the different nature of the business generally, it seems expedient to exclude salmon fishing as well as other kinds of river fishing from the statistics of sea fisheries. Salmon fishing, however, is dealt with in the reports of both the Fishery Board for Scotland and the Fishery Board for Ireland, and confusion has arisen in former times from the distinction between them and sea fisheries proper not being carefully made.

Another preliminary point which ought to be made clear is that we are looking here mainly at fisheries from the point of view of production. Historically, however, the point of view has been rather that of the politician and the statesman looking upon the sea fisheries as nurseries of seamen; or it has been that of people engaged in the trade itself, or of men of science

interested in the study of fish who have rather desired information as to the habits of fish and the places where they are to be found, than to have information of a purely statistical character as to the amount of production itself. Still, the general interest in the subject must be very largely of the same nature as the general interest in the subject of agriculture or mineral production.

Another point may also be noted here, viz., that not only is the production of fish a very small matter comparatively, in countries like the United Kingdom and the United States, but the fishing industry generally throughout the world cannot be an important one in comparison with other industries. We find in truth that the important countries in the matter of fisheries besides the United Kingdom are simply the United States, Canada, France, Norway, and Holland, these countries being stated in the order of their relative importance. Other nations no doubt have sea fisheries, such as British India, China, and the Australasian colonies, but the business is not one which has to be reckoned with internationally, although in many places it may be of some local value.

Looking at the statistics then as statistics of production, we find that the data in the United Kingdom with which we commence are those of actual returns of fish landed, made by local officers, principally officers of the Coast Guard, to the Board of Trade. In this respect the data must be considered to be fairly satisfactory. The officers appointed being placed all around the coast, and having opportunities

of knowing what is done by the local fishing fleets, with which they are in constant communication, are in a position to make fairly correct statements as to the quantity of fish landed, and also as to the value. The statements being likewise made at intervals of a month, they are made when the facts are fresh in recollection, while the supervision of the departments of the Board of Trade which receive them is constantly being exercised. It is a remarkable fact, however, that notwithstanding the great place occupied by fisheries in past times, such statistics as regards England are of comparatively recent origin, going no further back than about 1887, although both Scotland and Ireland had partial statistics, mainly connected with the herring fishery, which go back a long way.

These statistics are supplemented again by returns of the amount of fish conveyed inland on railways from different ports. These returns of fish conveyed inland preceded those of the value of fish landed, and are very useful as a check upon the latter. Here again the data are trustworthy, because they are the actual returns of the railway companies themselves which carry the fish. As far as quantity is concerned, as the fish landed at most places is for the most part conveyed inland on railways, there can be very little doubt in substance as to the weight of fish landed in this country.

As regards the fishery statistics of other countries on this head, there appear to be nothing more than annual or periodical returns of production, but the nature of the data is such that the fishery returns

made by the Governments concerned can be accepted. The Governments in question, like those of Canada, Norway, and Holland, have a great interest in the matter, as they are exporting countries, and a government like that of France necessarily exercises a constant supervision over the business, which is largely sustained by the bounties of the Government itself. The Government of France has likewise a keen interest in the matter, as it registers the number of fishermen, and has the power of calling upon them as recruits for the Navy.

In dealing with the compilation of tables from the data thus obtained, the most important point to keep in mind appears to be the difference in the kinds of fish, for which there are, in fact, separate trades. One kind of production especially important in the United Kingdom is that of what are called prime fish, viz., soles, turbot, etc., where the value is very high in proportion to the quantity. The herring fishery is also very much a separate industry; cod and ling fishing is separate, and haddock and mackerel also separate. Shell-fish, principally oysters, are again a distinct trade. Those who follow up the matter may be expected to have some regard to these principal divisions. Another point to be considered is that of the place at which the value of the produce of the fisheries is to be estimated. For convenience' sake, I have suggested that the place at which the value is to be put upon the produce is the place of landing, because at that point the produce is like an import, which for reasons of convenience, as we have seen, is

valued as at the place of arrival. It is fair to recognise, however, that great increase of value is frequently made to the fish landed by the process of curing and packing which is immediately engaged in, an addition to the value frequently as great as the value before the curing and packing are taken in hand. In the herring fishery especially, the curing and packing on shore immediately on the fish being landed are closely identified with the production; but it is important nevertheless, for comparative purposes, to distinguish between what is produced by those who go to sea in ships and boats and what is produced afterwards on land, although when the trade is looked at from certain points of view it may also be important to ascertain the whole value of the production, not when the fish are landed, but at the point where they enter the market. For comparative purposes, of course, it may be important to take care at which point the value is assigned to the production of the fisheries which are compared. A few statements will show the leading facts in this branch of statistics. According to the last return available the relative value of the different kinds of fish, with their quantity, was as follows in 1897:

[TABLE

QUANTITY AND VALUE OF FISH LANDED IN THE UNITED KINGDOM IN 1897.

	Quantity in 000's cwts.	Value in £000's.
Soles	81	565
Turbot	76	275
Cod	1,179	581
Haddock	3,443	1869
Herrings	5,069	1299
Mackerel	994	511
Ling	281	113
Pilchards	125	25
Sprats	86	15
Brill, plaice, and fish (other than salmon and shell-fish) not separately distinguished . . .	2,563	2261
Total . .	13,897	7514

The statement, it will be observed, includes neither salmon nor shell-fish. The important items as regards quantity are cod, haddock, herrings, and brill, plaice, etc., and these are also most important items as regards value, although soles and turbot, which are comparatively unimportant as regards quantity, are of importance as regards value. Going back to 1888, it is found that there has been a steady increase in almost all departments of the fishing industry as regards both quantity and value, the increase in value generally being from about 5·5 to 7·5 millions sterling.

With regard to the question of the extent to which the produce of the sea fisheries is used as an article of

food, we are able to make up the following short statement as regards the United Kingdom:

Produce of sea fisheries of the United Kingdom,	£7,514,000
ADD	
Imports of fish from foreign countries . .	£3,421,000
Total . . .	£10,935,000
DEDUCT	
Exports of fish from the United Kingdom .	£2,645,000
Total . . .	£8,290,000

From this statement it appears that on the whole the produce of the fisheries of the United Kingdom is not quite equal to the consumption, because on balance we import more from foreign countries than we export. It has to be considered, however, that the imports, being valued at the place of arrival, are exaggerated to some extent in comparison with the exports, which would more nearly balance the imports if they were also valued at the place to which they were sent. Whichever way the figures are looked at, however, it is evident that the consumption of fish as food in the United Kingdom is a comparatively small item in our total consumption of food.

The statistics of fisheries have not, in fact, given rise to controversies or differences of importance, partly, I believe, because the whole amount of the production is really so small. Whatever special interest attaches to fisheries in other respects, the primary

interest belonging to them as branches of production is not really very great, and consequently there are no great controversies or discussions regarding them. It is different, however, with reference to the connected question of the people engaged in fisheries where the political elements in the question have attracted a great deal of attention. On this head there is still a good deal of controversy as to the number of people concerned in fisheries. Many of those who take an interest in the subject are disposed, for very natural reasons, to exaggerate. The importance of our fishing fleet as necessary for seamen is especially dwelt upon, and very large numbers are sometimes stated as the numbers of fishermen. It may be pointed out, however, that the official statistics as to the number of fishermen, though there are serious difficulties in dealing with the matter owing to the number who are partly peasant farmers or labourers and partly fishermen, according to the season of the year, and owing to difficulties of a similar character, are really trustworthy. The returns are made from strict comparison of the number of fishing vessels and boats, and the crews which they require, so that there is no great room for mistake. As to the principal fishing vessels, the vessels of any size, there is no doubt whatsoever, because a complete account can be taken; and as to the smaller boats all around the coast, where there is a margin of error, the error is applicable manifestly merely to a portion of the subject, and that the least important. There is also a check to any overestimate of the numbers

engaged in the fishing industry of the country, in the produce of the sea fisheries themselves. Unless we are to suppose that the average earnings of the fishermen are very small indeed, it is easy to see that if we deduct from the produce of the fisheries a sum sufficient to remunerate the capital engaged in the industry, and to meet other expenses besides those of wages, then even if we give the fishermen for their wages no larger a sum than £50 or £60 per annum, we could not have a greater number of fishermen constantly engaged than from 70,000 to 80,000. At any rate, whatever the exact conclusions that may be formed, the elements of the problem are clearly furnished.

A comparison may also be made with the statistics of other countries on this head. In France the number of men engaged in fishing, exclusive of those who are put down as employed on foot, not in boats or ships, appears to be about 90,000, giving a very small return per man, if we deduct from the total produce of $3\frac{1}{2}$ millions even a moderate sum sufficient to remunerate the capital engaged and the other expenses of the industry, exclusive of wages. In Norway the crews of the vessels employed in the cod, herring, and mackerel fisheries are returned as all together 136,000, and as the total produce of these fisheries is only £1,234,000, I think we may take leave to suspect that there is possibly some duplication of the crews, and that people appear in the returns who are perhaps only fishermen for a month or two in the year. The crews

engaged in the sea fisheries of Holland, again, are returned as about 18,000. It would seem, then, that the high figures sometimes stated as to the number of fishermen in the United Kingdom have little support from a comparison with the statistics of other countries.

CHAPTER VIII

MANUFACTURING STATISTICS—MISCELLANEOUS PRODUCTION STATISTICS

Proceeding in natural order, having dealt with one or two great branches of production, such as agriculture and mining, we should go on to deal in a like manner with the statistics of other branches of production. Agriculture and mining constitute only a portion of the industries of a country like England or like France, Germany, and the United States of America. Countries which manufacture for export or which carry on a large shipping business, produce largely in different ways from those of primary production. Even in the most purely agricultural and mining countries also a large place must be given to production that is concerned with building and house furnishing, or with the making up of the raw materials of the textile industries, tailoring, dressmaking and millinery, and so on. It will have been seen, however, from the plan that has been actually followed, in which special importance is assigned to different branches of statistics, according to the actual place which they have come to occupy in discussions and in general use, that the logical

method may have to be departed from. Although in strict order those coming to the study of the statistics of production might expect to have the different branches treated according to their intrinsic importance, yet if in point of fact there are many statistics in one branch and much discussion regarding them, and there are no similar materials as to some other branch, we must be guided in the study to some extent by the actual conditions.

At this stage, then, we must point out that the statistics of the different branches of production cannot be gone into systematically, in this country at least, on account of the gaps which exist in the materials. And we go on to explain in what way statistical methods and information can be made available in dealing with these various branches of production. The United States exceptionally makes an attempt to obtain a statistical account of many kinds of production at the time of the census, on which remarks will afterwards be made. In recent years also there has been a special industrial census in Germany. But leaving such exceptions out of account at present, we may deal mainly with the cases where official statistics of miscellaneous production are more or less absent, having in view especially the state of matters in England.

With regard to the gaps themselves, it may be stated that, as a rule, in most countries official statistics are deficient as to almost all other branches of production besides those of primary production. Whatever the cause may be, there is no doubt of the

fact. No country and no community take the same pains with the secondary as with primary industries; neither as to house building, or house furnishing, or tailoring, or dressmaking, or the thousand and one industries that constitute the arts of life, is there such an attempt to have a statistical record as there is with the branches of primary production. I doubt if there generally could be such a record except at great expense. But apart from the possibility of it, we have here simply to recognise the fact of the absence of a record. As to the causes of its absence, I should say that the need for it does not seem to be felt as the need for a statistical record of primary production is felt. The demand for the latter appears, in fact, to arise in part from the interest of the subsidiary industries themselves in articles of primary production. Where the industries in question are near to the stage of consumption, their great variety and the absence of a common trade interest seem to prevent a natural demand for statistics regarding them, such as exists in regard to articles like cotton, wool, coal, pig-iron, wheat, sugar, and other articles of primary production and food. The very great attention, also, which has been given to import and export statistics, and to other statistics of trade which indirectly throw light on the facts of production, appears also to have been a factor in preventing the development of statistics of production themselves.

With regard to the way in which statistical information from other sources is brought to bear so as to fill up the gaps in the official statistics of pro-

duction themselves, it may be stated generally that the main idea is to combine and utilise the statistical records as to primary production itself with the statistical records of trade, the movement of goods, so as to obtain an indication as to what happens in the secondary industries. Other statistical information is also made use of. The method, however, can only be explained in the concrete and by means of actual illustrations.

We have to notice then first that there are certain branches of secondary production, like the cotton manufacture, where the scale of the industry is large, and the conditions in many ways resemble those of primary production itself. Reference is here made especially to factory production. Although the production here is not primary in the strict sense of the word, because raw materials which are obtained from the primary fields of production are worked up and made use of, yet the factory producer carries on his business at a stage which is separated, like primary production itself, by one or two intervals from the stage of consumption. His productions, in fact, have to pass into the currents of general trade like those of the primary producer, and are distributed ultimately to the consumer in much the same manner. The productions, however, are more various than those of the primary producer, and this of itself makes a difficulty in the statistical treatment. The method generally followed in such a business as that of the cotton manufacture to arrive at some idea of the production, is this : in a country like England, where

the whole (as in the case of cotton) or a very large portion (as in the case of wool) of the raw material is imported, the amount of the raw material used in the production is arrived at by ascertaining from the import and export statistics what are the imports of the particular raw material less the exports. This of itself does not quite show the consumption of the raw material in a particular year, because the stocks in hand may increase or diminish. The information then as to imports and exports is supplemented by information as to the stocks in warehouses before they pass into manufacturers' hands; and this is for the most part unofficial information, trade information, which is brought to the help of the official statistics. The figure of consumption thus arrived at, it is obvious, cannot in any single year be quite exact, because the stocks in the hands of manufacturers themselves, which vary in amount, are not taken note of. In a long series of years, however, no material difference is made by this superficial imperfection, and it may be doubted whether it really makes much difference in all but the most exceptional years. Again, information is obtained from the import and export statistics as to the exports of the manufacturers which are worked up from this raw material, and in the case of a manufacture where the business is for export to the extent of three-fourths or four-fifths or five-sixths, as is believed to be the case with the cotton manufacture in this country, then there are good materials for measuring the production itself with figures as to the consumption of raw material on one

side and figures as to the export of the manufactured article on the other side. In various ways estimates can also be made of the amount of the manufacturing which takes place for consumption in the country. But even this is not necessary from year to year in order to appreciate the general course of the business itself. Further, there is in England and in most other countries a census of the factory population obtained from time to time, partly for humanitarian reasons, but in whatever way obtained this census becomes a useful record, with which the raw material used and the export of manufactures can be compared. In this country especially, as regards the cotton manufacture, an additional means of information was provided a good many years ago at the urgent request of the cotton trade, in the shape of returns which are published weekly and monthly as to the amount of raw cotton conveyed from the ports to inland towns. These returns are obtained under the authority of a special Act of Parliament, the object being to furnish a check upon the unofficial market reports as to the increase or diminution of stocks, and the reported withdrawals from the stocks for consumption. But apart from this special effort made in connection with the cotton industry the general conditions as to factory production in the United Kingdom are the same, and the information as to raw materials upon one side and exports of manufactured articles on the other side, furnishes a necessary basis for information as to production itself.

Of course in countries where the raw material of

manufacture is largely supplied by the home production, the method would be somewhat different. If the country in question was also an exporter of the raw material, then the amount consumed in manufacture in the country would be shown by deducting the quantity of raw material exported from the quantity produced. To some extent this is what is done in the United States regarding the cotton manufacture. But in all cases the principle is the same, the combination of the information derived from import and export statistics with the information as to the production itself. The information, it may be added, is also combined in a different way for the purpose of the different trades. The matter is treated not merely from the point of view of a manufacturer in a particular country, but from the point of view of production and manufacture generally. International relations in trade are now so close that the practical business man feels a necessity at every moment to know what is going on in his business throughout the world, and hence in dealing with the statistics of what we may call international manufactures, the point of view of the interest of a particular country comes rather to be lost sight of, and the important matter is the general state of trade. Some of the publications of this nature come to be, in consequence, of very general economic interest. I refer especially to the annual circulars of Messrs. Ellison of Liverpool, respecting the cotton trade and cotton manufacture, and to the corresponding annual supplement published in September of the *New York Commercial and*

Financial Chronicle. The woollen trade is dealt with in a similar manner by Messrs. Helmuth, Schwartze & Co.; and there are circulars or pamphlets issued by members of the trade, dealing with linen, jute, silk, iron manufacture, sugar refining, and many more industries. There is also an official publication of the Board of Trade issued at frequent intervals, continuing statistics mainly as to production and trade which were laid before the Royal Commission on Trade Depression in 1885–86, in which the same method is applied with regard to various industries, so as to show their progression or the reverse.

To exhibit the kind of results thus arrived at we may refer especially to the cotton trade. The following table, which is extracted from Messrs. Ellison's circulars, shows in what way the quantity of raw material used in the cotton manufacture has increased or diminished at different times in this country:

RAW COTTON IMPORTED INTO THE UNITED KINGDOM, AND ESTIMATED CONSUMPTION IN MILLIONS OF LBS.

	1880.	1885.	1890.	1895.
Imported . . .	1588	1410	1872	1815
Re-exported . .	201	199	203	209
Excess of imports .	1387	1211	1669	1606
Estimated Consumption	1373	1344	1656	1632

A similar table shows the exports of the manufactured article:

VALUE OF COTTON GOODS AND YARN EXPORTED FROM THE UNITED KINGDOM.
(In millions of £'s.)

1880.	1885.	1890.	1895.
75·6	67·0	74·4	63·8

QUANTITIES OF COTTON GOODS AND YARN EXPORTED FROM THE UNITED KINGDOM.

	1880.	1885.	1890.	1895.
Cotton yarn (in millions of lbs.) .	216	246	258	252
Cotton piece goods (in millions of yards), excluding hosiery and sewing thread . . .	4496	4374	5124	5033

It will be observed that while, as regards quantities of raw material used and of manufactures exported, there has on the whole been great advance, although there has been a break in the advance in recent years, yet the figures as to values of exports do not show a like advance. In this is brought out a fact of very special interest in dealing with the statistics of a manufacturing country like England, which imports its raw material very largely. It will be found on further analysis that the different progression of the exports in values as compared with the exports in quantity, and as compared with the

quantity of raw material used in the manufacture, is accounted for entirely by the reduction in the price of the raw material itself. The values in such a case have clearly to be interpreted and not to be blindly used, as they may show a different course altogether from that of the real course of the trade.

We have to extract next from Messrs. Ellison's circulars the following table, which is made up in the way above described, from the returns of different countries, showing the consumption of the raw material of the cotton manufacture in different countries at different times :

CONSUMPTION OF RAW COTTON IN MILLIONS OF LBS.—AVERAGES FOR QUINQUENNIAL PERIODS.

	1866–70.	1871–75.	1876–80.	1881–85.	1886–90.	1891–95
United Kingdom .	974	1229	1255	1444	1541	1579
Continental Europe	653	857	1027	1315	1566	1906
United States .	382	525	686	857	1014	1261
Total . .	2009	2611	2968	3616	4121	4746

This table of itself contains a great deal of information useful to public men and others, respecting the course of the cotton manufacture. The superficial aspect, and to a large extent the true aspect, undoubtedly is that the manufacture has been rapidly extending to many more countries than England, and that the proportion of the industry of the world carried on in England has been steadily diminishing. Whatever may be the explanation, the fact is obvious and striking. The suggestion seems to me obvious

that one reason for the extension of the manufacture generally is the very perfection to which the industry had been carried in Lancashire, so that up to a point the methods of Lancashire could be imitated, and almost every country that was particularly desirous of it could have its own cotton manufacture. Development appears to be inevitable, for the simple reason that it would have been quite impossible for Lancashire, without an inconceivable increase of population, to go on manufacturing for the rest of the world. The development of the human race in civilisation requires, in fact, that throughout the world there should be a decrease of the proportion of people engaged in agriculture and in primary production, and an increase of the numbers engaged in the secondary industries. Still, this is not the place for comments, but merely for the statement of facts of interest to those concerned, and by way of illustration of the statistical methods employed. It is a qualification of the facts, however, that the comparison between different countries as to the quantity of raw material employed is not a perfect comparison. It is believed that, on account of the great perfection of the manufacture, more work in cotton manufacturing in proportion to the same quantity of raw material is effected in England than in any other country, and that the changes constantly going on in the manufacture are such that the proportion of work to the raw material used is constantly increasing.

With regard to the woollen industry, the following

table, extracted from the circular of Messrs. Helmuth, Schwartze & Co., will show the variations in the amount of raw material used at different times in this country. In this case, it will be observed, the account varies in form a little from that used in reference to the cotton manufacture, because England is, to some extent, a producing country as regards wool, and is also an exporter of the wool produced at home. So that, in addition to the net imports of foreign and colonial wool, a row has to be added showing the net amount of the home production which is also consumed in manufacture at home. The following is the table:

AVERAGE ANNUAL CONSUMPTION OF WOOL IN UNITED KINGDOM.
(In millions of lbs.)

	1871–80.	1881–85.	1886–90.	1891–95.
Domestic clip (estimated) .	156	133	135	146
Imports of wool, alpaca, and mohair	381	507	649	744
	537	640	784	890
Total exports . . .	186	288	356	399
Left for home consumption .	351	352	428	491

Similarly, the exports of woollen manufactures in this country have varied very greatly; the exports, however, in the case of wool not being quite so good an index of the trade as in the case of cotton, because the woollen manufacture is much more largely in proportion for home consumption than is

the case with the cotton manufacture. All that can be done here is to give the information for what it is worth, and to note that it is subject to the consideration that the amount of the home consumption can be shown only with difficulty :

EXPORTS OF WOOLLENS, YARNS, AND MANUFACTURES (BRITISH AND IRISH).

(Values in millions sterling.)

1880.	1885.	1890.	1895.
21·5	24·4	25·7	27·0

Comparing the two tables it seems obvious that they are subject to the observation already made with regard to cotton, as to the different progress shown by the quantities and the values.

The materials do not appear to exist in a convenient way for showing the course of the woollen manufacture throughout the world in the same manner as Messrs. Ellison & Co. show the progress of the cotton manufacture. Clearly, it would be possible for those interested, with some trouble, to do for wool what Messrs. Ellison & Co. have done for cotton. In a book like the present, however, which deals mainly with method, and with the kind of treatment to which statistical data may be subjected, it appears more important to note what may be done than to give mere statements of the facts.

I do not propose to multiply illustrations. In the

engineering trades statistics something of the same kind as those we find in the cotton and woollen trades are prepared. The data from the statistics of primary production, from imports and exports, and from other sources, are all combined by experts so as to give especial account of the particular manufacture.

In the pottery trade the North Staffordshire Chamber of Commerce publishes statistical information annually of a similar kind.

Ship-building, again, furnishes another illustration. Here there are annual official statistics of ship-building, but full unofficial accounts are also published locally. At the beginning of every year the leading newspapers of Glasgow and Edinburgh give an account of the industry on the Clyde, and the same information is also given for the Tyne. In this case, however, the information is derived in a less degree than in the other cases from statements as to the quantity of raw material used, and from import and export statistics. It is mainly a direct account of the quantity of the production itself, for which the comparatively small number of the articles produced, although each individual article is of considerable value, furnishes unusual facilities.

With regard to ship-owning again, there are materials for statistics in the trade circulars giving information as to freights, as well in the returns already referred to as to persons employed.

It would be needless, however, to enumerate the various unofficial publications of a statistical kind in which the data from unofficial statistics as to primary

production, imports and exports, factory returns and other sources, are worked up so as to furnish materials for a statistical account of a given manufacture existing largely or mainly for export. It cannot be said, I believe, that it is of the same general interest to follow out the statistics of each manufacture, however interesting the account may be to those concerned, as it is to follow out the statistics of primary production. As we descend into details the information comes to be of more limited use and interest, and unless the statistics as to manufacturing production can lead up to general conceptions affecting the whole industrial field, it would be possible to lose one's self in all the detail and at the same time fail to use the statistics for the general purposes serviceable to students.

We have next to notice those industries of a miscellaneous kind where the conditions are not quite the same as in the case of manufactures carried on upon a large scale like the cotton manufacture, and where much information can be obtained from the quantity of raw material used in the industry on the one side and the quantity of manufactured articles exported upon the other side. We refer now to such industries as house-building, house-furnishing, tailoring, millinery and dressmaking, shopkeeping, and many more, constituting the miscellaneous avocations of every country, but more highly developed in old and rich countries like England than in others. No doubt some of these industries in the aggregate, like the building trades and the

tailoring and dressmaking trades, are even more important than the manufactures upon a large scale which have been referred to. In this country, at any rate, the building trades in the aggregate are almost on a par in importance with the business of agriculture itself, and are quite equal in importance to any one group of manufactures, such as the cotton manufacture. Many of the miscellaneous industries included in the present category, however, are very small, while even those which are important in the aggregate, like house-building, are widely scattered, and it would be supremely difficult, if not impossible, to show results in the aggregate such as can be shown for mining and cotton manufacture, where the points at which statistics have to be collected are comparatively few. It may be said then, that as regards these miscellaneous productive industries of the secondary kind, separation and classification, such as would be necessary for dealing with them statistically in a direct manner, are generally impossible. Accordingly statistical information as to these kinds of production is confined mainly to what is given by the census as to the number of persons' employed, supplemented by scraps of information from the import and export returns, and from other sources. Formerly, when there were more taxes in existence than there are now, means of information of a special kind existed as to some of these home industries. With regard to the building trades, for instance, information was given by such taxes as the window tax, which was regulated according to the number of

windows in a building, and by other taxes, such as the duty upon bricks and the duty upon the import of timber. The fire-insurance duty again, was a source of information as to the value of houses and the contents of houses, and the relation of one value to the other. Information, again, was given as to another large group of trades by such duties as those upon soap and candles. In regard to one or two trades which are still affected by inland revenue duties, information still exists by which the particulars given in the census can be supplemented. I refer especially to the connected trades of brewing and distilling and the public-house trade. The internal revenue statistics, as we have seen, contain information as to the production in these industries and the extent to which they are carried on, which is of general value for other purposes as well as the direct information they give respecting the trades concerned. Looking at the whole of this group of industries generally, however, we may say that at the present time we are mainly dependent upon the information in the census, supplemented by scraps of information from the import and export returns.

Making the best of the materials we may simply notice, according to the census of 1891, the relative proportion of some of the chief industries to each other, according to the numbers employed. For this purpose we include the industries of primary production as well as those which are here specially referred to, and including the great railway industries. The following is a short table which will be sufficiently

illustrative for the present purpose, summarised from the last census of England and Wales:

PERCENTAGES OF PERSONS ENGAGED IN EACH GROUP OF OCCUPATIONS AT THE CENSUS OF 1891 TO TOTAL PERSONS OCCUPIED.

Agriculture	10·2
Commerce (merchants, commercial clerks, bankers, etc.)	3·2
Conveyance	7·6
Miners	4·3
Machines, implements, metals and ships	7·3
Houses, furniture and decoration	6·4
Textile fabrics	8·8
Dress	8·5

The effect of these figures is to show in broad outline the relative importance of different industries in the country. It is quite clear that agriculture, mining, the textile industries, the iron and steel industries, including engineering, ship-building and the making of machinery, the building trades, the tailoring and dressmaking trades, the railway industry, and finally commerce (including banking, insurance, etc.), constitute the bulk of the business which is carried on in England and Wales. The separation between one kind of business and another is not always, and, in the nature of things, can very seldom be exact. Shopkeeping especially is mixed up with manufacturing industries in a very peculiar manner, many shopkeepers undoubtedly calling themselves manufacturers, although their main business is not manufacturing but simply that of wholesale or retail dealing. One use of such figures, however, is that, if in a few of the groups the production is ascertainable with more or less exactness, as is the case with agriculture and mining, they enable one with some

discretion and with the help of all the other information available, to build up and cover all production as regards trades where direct statistics are not available, as in the case of primary production. In the mere statement of relative numbers employed there is an indication of relative importance.

It is not intended here to say much by way of comment, but on account of its statistical importance in many studies I should like to draw attention to the proportion of the population engaged in what are usually spoken of as manufacturing industries. It is a matter of common knowledge that England to a large extent engages in manufacturing for export, and frequently the export trade is spoken of as if it were of supreme importance to the welfare of the country, and as if every one more or less made his living out of the export trade. As a matter of fact, the population engaged directly in manufacturing, both for the home consumer and for export, does not much exceed one-fifth of the total population. The proportion engaged in manufacturing for export alone, is certainly very much less than one-fifth; is probably not more than one-tenth of the total, and in England on account of its wealth the proportion must be very high. A country then hoping to introduce manufacturing industries by artificial means, could not hope at best to add seriously to its population, or even to its wealth, because the whole amount to be gained is the difference in the return from carrying on that industry at home as compared with the return from other

industries by which the products of the industry proposed to be set up could have been purchased from other countries. It is unfortunate, I believe, that in many discussions on the question of free trade and protection the extent of the gain expected to arise from a particular protectionist measure has never been stated or considered by either side, and in the same way the extent of the loss inflicted by minor protectionist measures has not been accurately measured. Clearly the numbers to be affected by any measure and the extent to which they are to be affected are important matters in all such discussions.

To a certain extent, as we shall find, the official statistics of the country, especially the statistics of the income-tax and of the death duties, now contain a great deal of information as to these miscellaneous industries, in the aggregate and in the mass, but without any precise definition of particular classes and groups. This subject will be dealt with in its proper place, and it is merely intended to note here that in the absence of direct statistical information as to production in a great many groups, there is other information bearing upon the subject which is useful for various statistical purposes, although not for such purposes as are served by the statistics as to agriculture, mining, and other industries which have been already discussed.

This is also the place to notice that a new source of information as to all these matters is now being developed rapidly in the form of the accounts of joint-stock companies, by which so many businesses

are being carried on. It is now possible to do for some of these industries what it has long been possible, as we shall see, to do for railways, banking, and other conspicuous joint-stock enterprises. After a time there is no doubt it will be possible to build up from the accounts of public companies connected with brewing, cycling, shop-keeping, and many more industries, an account of what is produced, and what are the profits, and what is the turnover generally. The development, however, is still at too early a stage for very much to be made of general statistics in this direction.

I propose then to leave the statistics of production at this point, having shown what the nature of the information available is, and how statistical accounts can be built up in different ways. There is one branch, however, of great importance, analogous to that of the import and export statistics, viz., the railway statistics, to which it is proposed to give a separate chapter, joining with them to some extent the tramway and canal statistics, which are by no means, however, of equal importance in the modern world.

Before leaving the subject it may be expedient to return to those exceptional cases which have been referred to, where countries do attempt to give direct statistics of production generally. I refer especially to what is attempted in the United States at the census. A great deal of money has been spent in the United States at each census for a long time past in order to obtain an account of the production, not

merely in the primary industries of the country, but in what are popularly called the manufacturing industries. In the latter an account is given of production, as well as of the capital invested and profits earned and other particulars. I believe, however, it will be generally agreed that while a good deal of interest attaches to much of the statistical information thus obtained, with reference to particular trades, there is no adequate attempt to bring the information into line and to show its connection with the general business of the country, which would be essential to the proper use of such statistics. In some cases, at any rate, the production was so stated as to duplicate the aggregate production of the country, and to leave it quite uncertain what figure ought to be stated as the aggregate manufacturing production, seeing that in each industry raw materials obtained from other industries were used. It is obvious, again, that nothing is more difficult to state than the amount of capital engaged in a particular industry. One manufacturer will return his capital as £100,000, while another manufacturer, from the same materials and with the same plant and machinery, might with equal propriety call his capital £200,000. Unless those who are getting up the statistics have some uniform method, which is fully explained, of ascertaining the capital, it is clear that very dubious figures may be got together which are totally unsuitable for comparative purposes. The statement as to profit earned is liable to similar observations. Dealing with the same materials different companies will bring out quite different accounts of profit earned, as one may see, for

instance, in the accounts of ship-owning companies, where the most various sums are put aside for depreciation and other items, which all have an affect upon profit. Even the amount of sales is not an easy thing for statement for the purposes of statistical returns unless there is careful definition beforehand and a careful examination of the returns themselves when they come in. Above all, the account of manufacturing production in this form is necessarily incomplete, because manufacturing businesses on a small scale are omitted, while there is no attempt to deal with those businesses immense in the aggregate, but highly scattered in detail, such as the house-building and house-furnishing and the tailoring and dressmaking businesses. The latter, however, are just as important in a general account of production as the accounts of manufacturing itself, and little is done towards giving a general account of production when statistics of manufacturing on a large scale are added to those of primary production, without any note being taken of those great miscellaneous industries which make up so much of the business of every community.

The same remarks appear to me to apply to the statistics of industrial production which have been published in Germany, where the very minuteness with which the work is professedly done, raises doubts as to the methods employed and the possibility of obtaining so much of the information which is professedly published. Still, the attempt in Germany is free from some of the defects which attach to the work done in connection with the United States census, and at

least there is some effort at completeness. There is absent from it, however, any attempt at a statement of the total production of the country, and it amounts in fact to very little more than a complete census of occupations.

CHAPTER IX

RAILWAY STATISTICS

To a certain extent railway statistics occupy a place in the statistics of production and trade alongside the import and export statistics, with which we have already dealt. Railway statistics have to do with the conveyance of goods and with the conveyance of mails and parcels, and as their principal other business is the conveyance of passengers, whose movements are very largely though not exclusively connected with business, there is no doubt that railway statistics, like the import and export statistics themselves, contain indications as to the general movement of business throughout the country. These statistics in fact are probably more serviceable generally as an indication of trade, putting all the countries of the world together, than the import and export statistics themselves, because they are applicable in every country, whether it has a large foreign trade or not. In this country the import and export statistics happen to be very useful generally, because of the great importance of the foreign trade. But even here the supplementary

information given by the railway statistics in their bearing upon the movements of trade is most valuable. It should be pointed out, however, that while to a large extent railway statistics belong to the branch of production and trade in much the same manner as import and export statistics belong to that branch, yet there is an important use, or more than one important use of railway statistics of a somewhat different nature. The statistics which now include those of capital raised and expended, and of profits earned, have to be considered from the point of view of those concerned in the business, and from the direct light which they give as to what is undoubtedly a form of production. The service rendered by railways is, in fact, like the production of a commodity, just as we have seen that the service rendered by merchant ships in carrying goods and passengers is in the nature of direct production. Both points of view must be kept in mind in dealing with the statistics.

With regard again to the information given by railway statistics respecting the movement of goods, it may be pointed out that they cannot be used in quite the same manner as the import and export statistics, because the movement of goods in the railway returns is not treated with the same detail. There is no publication generally showing the districts from which the goods come and the districts to which they go, and classifying them under all the different descriptions which are used in the import and export statistics. The difference will appear as

we describe the main objects of the statistics, and the nature and origin of the data.

The objects with which railway statistics have been instituted are primarily to obtain information for the officers and share-holders of the companies and also for the Government, as to the working and business of the railways themselves. Those interested as owners, and with them the public interested in investing and dealing in the shares and property of the companies, desire to know how the business goes on, and the Government for its part is interested as the power which gives to the railway companies their monopolies and privileges, and which is entitled to see that these monopolies and privileges are continuously used for the advantage of the public. The statistics are, in fact, based mainly on the accounts of the business of the companies, and are really comparative statements deduced from the accounts on such points as experience shows to be useful to those interested, to let them know what they are doing. When a Government owns a railway, it is primarily from the same point of view that it has accounts and returns prepared. It is only by a secondary use of the statistics that they have been made available for Government and public men as means of information respecting the general business and condition of the country. Their primary object is different, and is mainly, as has been stated, to inform those concerned as to the business of the companies as money-making concerns, and to enable the Government to control them in the interest of

the public. As to some of the statistics, especially those relating to accidents and various points connected with the working of railways, the Government and the public are more directly interested from the beginning from the humanitarian point of view, and the statistics on some of these points can hardly be said to have much bearing on the question of movements in business. But in the arrangement of the statistics regard must be had mainly to the principal objects, whilst the others are not overlooked.

The data for the railway statistics are mainly the accounts of the railway companies themselves and the returns ordered by Parliament which, except as to accidents, are annual returns, while the accounts of the companies are themselves half-yearly. We are speaking mainly of the United Kingdom, although there are very similar arrangements in almost every country. The particulars required relate to the mileage of the companies; to the amount of capital raised in its different forms of ordinary and preferred shares and loan capital; to capital expended; to the quantity of traffic both in passengers and goods and in miscellaneous business, since railway companies are not quite exclusively confined to the carriage of goods and passengers; to the earnings from the traffic, both gross and net; to the working expenses; to accidents and to miscellaneous information. The data, it may be considered, are, in their foundation, excellent, because the figures are supplied by those who are in a position to supply them correctly, and they are contentious figures, being continually under

the check of those who are interested, and of the Government and public, who look at them from a more general point of view. This applies to the information given both by the accounts of the companies and by the returns to Government. The forms of the accounts and of the returns are both prescribed by Parliament, and the returns themselves are, in England and most other countries, subject to the supervision of a Government Department, the Board of Trade being charged with the duty of receiving them and presenting them to Parliament. A good deal of information, however, is published by the companies which is not in the same position. We refer to the weekly estimates of receipts from traffic which are issued by all the leading companies, not merely in this country but throughout the world. These weekly estimates are the foundation of much interesting discussion as to the state of general business with which they are concerned, as well as discussion as to the progress of each company itself from the point of view of its own business. The data here are also for the most part excellent, though they have occasionally been vitiated for speculative purposes. The companies supply them under the vigilant inspection of an acute class of capitalists and speculators; and, on the whole, in spite of exceptions which may almost be spoken of as accidents, they are to be relied upon generally as an indication of the progress of business.

The dangers in the compilation and the handling of the data, which are thus excellent in themselves,

are inherent in the subject matter to which they refer. Even in regard to mileage there are obvious difficulties of definition. The construction of a mile of railway according to the perfection with which the work is done, the solidity of the road-bed, the weight of metal and other causes of difference, may mean one thing for one company at one place, and another thing for another company at another place. One mile of railway is thus not a unit which is all the same at every time and place. Then in the statement of mileage the question occurs whether the mere measurement of distance between two places is to be taken as the mileage, whether the company has one, two, three or perhaps even more lines of rail established between the two places ; and the question has also arisen whether what are called sidings are to be enumerated as part of the mileage. The usual rule is to consider mileage as the distance connecting two places, whether there are two, three, or more lines, knowledge as to the distance covered by railway connections being itself a fact of some importance. But it is quite obvious that a mile of railway, a single line only, through a comparatively empty country, is a very different thing from a mile of railway in a crowded country, where there are two, three, or four lines, and even more at some parts of the connection. There are inherent difficulties again connected with the definition of capital, because, as every one knows, there is such a thing as the watering of capital so that the figures stated may or may not be nominal figures merely, and do

not show the actual money that has been raised. Even an account showing the actual money that had been raised would not in all cases give a figure of capital corresponding to what would be shown in some other account, because the one figure might relate to a capital which had been maintained intact or more than intact, the property represented being worth more than the money which had been raised, and in another case the figure of capital, owing to the depreciation of the property and other causes, might be represented by insufficient assets. The unit of capital, therefore, in the railway business is no more uniform throughout than the unit of capital in any other business. The same remarks apply to capital expenditure, because one company may include in that expenditure interest paid out of capital and another may not, and the greatest difference may thus arise. To take an illustration, for instance, from a somewhat different field, we know that in the construction of the Suez Canal, on account of the payment of interest out of capital during construction, very little indeed of what the shareholders subscribed was expended on actual construction, and the canal would never have been made but for the subventions and assistance of the Egyptian Government, which supplied the greater part of the means of construction. Difficulties again arise in the statement of the traffic of companies, owing to the difficulty of reducing the quantities conveyed to a common denominator, a ton of goods conveyed ten or twenty miles being obviously a

different quantity in all respects from a ton of goods conveyed one or two hundred or one or two thousand miles, and the same remark applying to the movement of passengers. There are also great difficulties and complexities in English accounts with regard to the division of working expenses, and under what heads the different items are to be put. How much, for instance, of the traffic expenses, which include the working of signals and other expenses of that kind, should be charged to the conveyance of goods, and how much to the conveyance of passengers? In the accounts of some foreign companies and in the returns issued by some foreign governments the expense of conveying passengers and goods per mile is set down with wonderful minuteness in a way, I believe, which railway managers in this country pronounce to be impossible; but whether such figures can be arrived at or not, it is quite clear that a great deal of debate is necessary to settle the principles upon which division of the items of expenditure is to be made.

In dealing with another part of the statistics again there are also serious difficulties of definition. What is a railway accident? is one of the questions which may be put. Is every accident which may occur upon the premises or property of the railway company to be considered a railway accident, or are we to confine the record merely to accidents which occur in the movement of engines, carriages, and waggons upon the railway? Would it be proper again to class as a railway accident the injury to a

person who throws himself in front of a railway train and is either killed or maimed? These and other matters are clearly things which require an attentive definition in dealing with the statistics of railway accidents, and the mode of dealing with them is not one to be easily settled. Another difficulty arises in connection with the proportion of accidents occurring to those who are liable to the accidents. In the working of railways, as in the working of ships at sea, it is most desirable to know what the danger to life and limb is amongst those who are exposed to the accidents, and it is quite clear that there are great numbers employed in railway service who are no more exposed to the accidents which take place in the working of the railways than people employed in docks or warehouses at a distance from the railways themselves. How these various difficulties are overcome and dealt with in the statistics of different countries, it is impossible for me to say, but they are points which should be looked into by every student who proposes to make comparisons.

Coming now to the discussion of the principal questions for which railway statistics are used, looking at them in the double aspect of the working of the railways themselves and of their utility as a means of giving information as to the general state of the country, I wish to refer especially at the beginning to the annual railway return which is issued by the Board of Trade, and to the annual report on railway capital, traffic, and expenditure which is issued by the same department. These are among the docu-

ments familiar to those who take an interest in these matters, and they contain in themselves, especially the annual report to the Board of Trade, an indication of the kind of use to which the statistics can be put.

The figures as to railway mileage suggest, on the face of them, the importance of the considerations above stated as to the difference between one mile of railway and another. The total mileage in the United Kingdom is 21,433, this being the mileage representing the distance between place and place which are connected by railway; and of this 21,433 miles there are 14,818 in England, 3447 in Scotland, and 3168 in Ireland. But whereas the receipts from passengers and goods traffic per mile of railway open in England amounted in 1897 to £5052, they amounted in Scotland to £2914 only, and in Ireland to £1097 only. A mile of railway in England, therefore, is clearly a very different thing from a mile of railway in Scotland, and still more from a mile of railway in Ireland. Other comparisons, such as the amount of capital per mile of railway open, would bring out the same result, which is, however, so obvious that it need not be enlarged upon.

The next point to be noticed is that of capital, and we find that in 1897 the capital of all the railways concerned amounted to the figure of 1090 millions sterling, of which, however, no less a sum than 153 millions represented nominal additions on the consolidation, conversion, and division of stocks. Deducting these nominal additions, the capital would come out as 937 millions; but even of this sum it

could not be said that it represents with accuracy either the money actually expended in making the railways, including the cost of purchasing the land on which to make them, or the actual value of the railways at the present time which could be deduced from the valuation of the different stocks of the companies, according to the market prices of the day upon the Stock Exchange. The capital of a railway company, like capital in most other businesses, is thus to some extent an accidental figure approximating more or less closely to the actual cost of making the undertaking, and sometimes to its market value, but not necessarily being the same thing.

An interesting point as to the capital is its division into different categories—a corresponding division taking place in many other kinds of business, but the distinction being well known and marked in the case of railway companies. Out of the 1090 millions sterling above mentioned it is found that the sum of 292 millions is represented by capital having a first charge and preference, viz., loans and debenture stock, more than 25 per cent of the capital taking this form. Next there is guaranteed or preferential stock amounting to 372½ millions, rather less than 40 per cent of the capital taking this form, which is that of a second preference or charge upon the undertaking. Finally there is a capital of 425½ millions, representing nearly 44 per cent of the total capital, and this is called ordinary stock, and represents the margin of capital with a fluctuating dividend, according to the prosperity or reverse

of the undertaking. The division into the three classes of capital has grown up quite naturally, and indicates certain tendencies in the minds of different classes of investors, some being attracted by the maximum of security given by the first charge stocks, others by the conditions of the second charge stocks, which are secured in some way sufficient in their eyes, though not so amply secured as the first charge stocks; and others again being attracted by the last class of all, where the investor has to depend exclusively upon the prosperity of the undertaking. It is significant of the strength of this tendency to specialisation of investments, that even the ordinary stock, which is placed all in one category in the general totals of the official returns, has itself come to be divided up in very many cases into preferred and deferred, the preferred ordinary constituting, in fact, a third form of preference capital not so well secured as the first and second, but still secured in some way, and the deferred ordinary being a smaller marginal capital, and therefore more liable to fluctuate with the changes in the condition of the undertaking than the ordinary stock itself. A curious result is that, according to a table (Table 3) contained in the report to the Board of Trade already referred to, the rate of interest actually paid on the different descriptions of capital is singularly alike. On the loans and debenture stock it is 3·54 per cent, on the guaranteed and preferential capital it is 3·95 per cent, and on the ordinary capital it is 3·91 per cent; these being the figures for 1897, but not much difference

being made by taking the figures for any preceding year. It must not be inferred, however, that it is the same thing to an individual whether he puts his money into the one class of capital or the other. These represent the results merely to the original investor. The rate of interest obtainable at the price which would actually now have to be paid for the stocks is a very different thing. Taking this into account, the yield to the investor on all the different descriptions of stock at the actual price which he would have to pay for them, would be something much less than what is above shown, and it is by no means certain that the relative rate of yield would not also be changed; the rate of yield on the best stocks would no doubt be enormously reduced. Against this, however, would have to be set, in the case of the ordinary stocks, the speculative value which they sometimes attain owing to the way in which the expectations of the future are discounted, which is another reason for the reduction of the actual yield to the investor of the dividends paid upon the price which he pays for the stock.

Another point of comparison is also suggested by these figures, viz., the proportion of the capital invested in railways to the total capital of the community. Whether we take the figure of 937 millions or the larger figure of 1090 millions, it is plain that the proportion of the assets of the community represented by railway undertakings must be considerable, and, in fact, as we shall afterwards find, railways come next to land and houses them-

selves in reckoning up the property of a community. The rate of interest earned, viz., about 4 per cent, and the changes in that rate of interest, which seems to have been steadily declining, though not greatly so for a good many years, is also a matter of concern when we come to deal with money-market questions, and with the various questions as between profits of capital and wages which have their place in economic discussions.

Coming to the question of traffic, we find that the gross income of the companies having the above mileage and capital was, in 1897, 93·7 millions sterling. Of this amount, 40½ millions were derived from passenger traffic, 47·8 millions from goods traffic, and 5·4 millions from miscellaneous sources, including rents, tolls, revenue from steamboat and other items. It would thus appear that goods traffic is the source of rather more than half the gross income of the companies, and that of the remainder, about 10 per cent, is derived from miscellaneous sources, and 90 per cent from passenger traffic. Goods and passengers are thus the two main things to be looked at in the business of railway companies, goods being considerably the more important of the two in the United Kingdom. In the subdivisions of this traffic again, there are points of interest. Of the 40½ millions received from passenger traffic, no less than 25½ millions are receipts from the conveyance of third-class passengers, the remaining items being the £3,200,000 from first-class passengers, £2,300,000 from second-class passengers, 3 millions from season-

ticket holders, and no less than $6\frac{1}{2}$ millions from excess luggage, mails, etc. The third-class traffic is thus of by far the greatest importance to the railway companies, and on a stricter division this would perhaps be even more important than it appears, because the receipts from season-ticket holders and from excess luggage, etc. would, upon this strict division, have to be divided among the different descriptions of passengers, and although it is probable that there is a larger proportion of season-ticket holders and of excess luggage to be credited to both first and second class than corresponds to the actual numbers of ordinary passengers by those classes, yet the amounts so credited would not alter very much the preponderating importance of the third-class traffic. It would be out of place here to go into the history of the development of the different kinds of passenger traffic, but it is well-known and has been observed upon for many years that it is the third-class traffic which has been growing relatively to the others.

Coming to the goods traffic, we find that the divisions are: mineral traffic, £19,747,000; general merchandise, £26,737,000; and live-stock, £1,373,000. The divisions here, however, carry us very little way. The mineral traffic is no doubt to a very large extent the conveyance of coal, but the item of general merchandise is so large and so various that practically it may be said we have almost no information as to the constituents of this traffic beyond the magnitude of the coal traffic and of the very small

live-stock traffic. We learn from another table that while the receipts from minerals, as we have seen, are much less than the receipts from general merchandise, yet the quantity of minerals conveyed in 1897 was 267 million tons as compared with 107½ of general merchandise conveyed. In the absence, however, of any account of the ton mileage, as it is called, we cannot infer from this the relative work done by railways in conveying minerals and general merchandise, while there are other difficulties in making the comparison as well as that of the distance over which the goods are conveyed. The relative importance of the two classes of business is probably indicated better by the relative gross receipts to the railway companies than by any other figures which could be substituted.

Another point suggested for comparison is that of mileage actually run by passenger and goods trains respectively. While the receipts from goods traffic, as we have seen, are very much larger than those from passenger traffic, we find that the mileage run by goods trains is altogether 163½ millions of miles, and the mileage run by passenger trains is a little over 202 million miles. It would seem, therefore, that in earning 40½ millions sterling from passenger traffic the railway companies do more work than in earning nearly 48 millions from goods traffic. The explanation no doubt is that there are trains and trains, many of the passenger trains being lighter and more easily worked than the ordinary goods train. Whatever the explanation may be, the differ-

ence in the nature of the business shown by these statistics cannot but be instructive to the special student of railway matters, as we shall see when we come to deal with the question of working expenditure. Train mileage, it may be useful to explain, in the sense here used, is the mileage actually run by a train between one place and another in earning money for a company. It does not include the mileage actually performed by engines and carriages when they are being shunted, or when they are returning empty.

It is often suggested that in addition to showing the mileage actually run by trains, it would be important to show the mileage actually passed over by the goods themselves, or by the passengers, so that it would be possible to obtain for other comparisons a unit of a ton mile of goods and of a passenger mile of passengers. No such particulars have yet been furnished by English railway companies, although it has frequently been suggested to them, and although many foreign countries and governments give similar particulars, and it would seem that no real difficulty can exist in the matter. To obtain the ton mileage of all goods carried by weight, nothing more is necessary than to multiply the different quantities of goods put on the lines for conveyance by the actual distance which they are carried, and similarly for passengers nothing more is necessary than to take the distances which passengers travel from the tickets which are given to them. The materials must exist in the hands of

the railway companies, however they are to be worked up. In the case of season-ticket holders there is no doubt a difficulty, because it is not possible to tell the amount of railway journeying which a particular season-ticket holder actually makes. An average, however, could be arrived at with some trustworthiness, even in the latter case. The railway companies in the United Kingdom, however, have always opposed giving statements as to the ton mileage of goods and the passenger mileage of passengers, and there is no doubt that the units when thus obtained would be capable of misleading in the different comparisons for which they are actually used.

The next point of interest in connection with the working of railways, as in the case of other forms of enterprise, is the rate of expenditure by which the gross income is earned. In the United Kingdom this rate of expenditure in 1897 appears to have been 57 per cent of the gross earnings. The gross earnings from railway working, as we have seen, amounted in that year to 93·7 millions sterling, and the expenditure in the same year was just over 53, thus making the proportion about 57 per cent. According to the statement in the report which we are following, this proportion of 57 per cent is, with the exception of 1893, when the same level was reached, the highest yet recorded, though for several years the proportion has been as high as 56 per cent. There are, of course, great variations as between individual companies, and in one of the tables appended to the report we find that this proportion among leading companies in the

United Kingdom varies from 60 per cent in the case of the Taff Vale Companies and 63 per cent in the case of the Great Northern Company, to a minimum of 52 per cent in the case of the Caledonian and Furness Railways and the Midland Great Western of Ireland, and 51 per cent for the North British. Most of the leading companies, however, including the London and North-Western, the Lancashire and Yorkshire, the Great Western, and the Midland, are either at the exact average of 57 per cent or 1 per cent above and below that figure. Common causes must, therefore, be at work over the general system of railways in the United Kingdom to produce such like results.

It would be out of place to go minutely into the different component elements of this working expenditure. At this point we come in contact with the special business of the railway experts, to whom this question of working expenditure and how it is to be increased or diminished is all-important. We may just notice the four principal items, according to the report which we are following. Out of the 53 millions of expenditure we find £8,620,000 spent upon the maintenance of way, work, and stations; £13,710,000 spent upon locomotive power; that is, actual expenditure in running the engines by which the trains are moved; £4,370,000 upon repairing and renewing the carriages and waggons; and £16,510,000 upon what are called traffic expenses, which include the actual working of signals, the payment of station-masters, guards, and other officials, and all other

outlays in connection with the traffic not included in the previous three headings. There are, of course, other outlays, such as rates and taxes, law expenses, compensation for accidents, general management and the like, but the main items are the above four which have been stated. Analysing these particulars a little more closely, it is found that among fifteen companies, representing about 83 per cent of the whole railway expenditure of the kingdom, the expenditure on coal and coke under the heading of "locomotive power" amounted to £3,031,000, and that on wages alone in the traffic department and in the locomotive department, including repairs and renewals, to no less a sum than 17¼ millions. The expenditure on wages, making an allowance for the remaining companies, would thus amount to about 20 millions per annum. If it were possible to obtain an exact figure of the numbers of railway servants receiving these wages, then we should have an exact average wage for this large class of workmen, which would be of great utility in connection with wages statistics generally. The numbers, however, for this purpose cannot be stated very accurately, especially as the wages are paid in part to a fluctuating body who are taken on at one season of the year and discharged at another season. It was stated, however, in a special report to the Board of Trade dealing with wages published in 1893, and in which special returns from railway companies were made use of, that the average earnings per person appeared to be about 20 shillings weekly, which would cor-

respond with an army of rather more than 400,000 persons receiving the above sum of 20 millions annually.[1]

Both the working expenditure and receipts of railway companies are reduced to a statement of so much per train mile, this being a convenient unit of comparison. The receipts and expenditure per train mile in England, Scotland, Ireland, and the United Kingdom respectively in 1897 were as follows:

RECEIPTS AND EXPENDITURE PER TRAIN MILE IN 1897.

	Receipts.	Expenditure.
	d.	d.
England.	58·99	34·02
Scotland	51·39	27·04
Ireland	50·81	28·54
United Kingdom . . .	57·66	32·89

These figures, of course, show the same percentage of expenditure and receipts as are above exhibited, but to have them stated in the form of so much per train mile is of obvious convenience for reference and discussion. The comparison is especially useful in observing the progress of the railway companies. It is found, for instance, that while the receipts per train mile have remained comparatively stationary in England and in the United Kingdom, for the last ten years, and have even declined a little in both Scotland and Ireland, yet the expenditure per train mile has increased from 30·66d. in England in 1888 to 34·02d.

[1] The numbers of railway servants of various classes in 1895 were given in the report on accidents for that year, and the total was 465,000.

in 1897; in Scotland from 25·87d. in 1888 to 27·04d. in 1897; in Ireland from 28·11d. to 28·54d.; and in the United Kingdom from 29·97d. to 32·89d. These figures make it apparent that if railway companies have been enabled to maintain their dividends or nearly so over this long period, it has been in consequence of the greater extension of the business, and not in consequence of any increase of profit from the actual work done per train mile; in fact there has been a steady increase of the amount of work done in proportion to the earnings.

So far we have been dealing with the railway companies mainly from the point of view of the railway shareholder and of the Government as generally interested in an enterprise which it regulates, but it will be seen, even from the statements which have been made, in what way the figures of railway business may throw light upon the general business of the country. The differences in the numbers of passengers conveyed from year to year and in the quantity of goods conveyed are obviously significant of the movements of business generally. When railway figures are looked at in this way it is found that with one or two exceptions there has been very great and very rapid growth. In the last ten years, when the figures are analysed, it is found in fact that the receipts from passengers have increased in the United Kingdom from a total of £30,984,000 in 1888 to £40,518,000 in 1897, or about one-third in ten years. The receipts from goods again, have increased from £38,756,000 in 1888 to £47,857,000 in 1897, an increase of one-fourth

in ten years. These are much greater rates of increase than the increase of population, and as the railway system has not been added to in that time to any material extent, the new mileage of railways being quite insignificant in character and earning-power in comparison with the old mileage, then it follows that there must have been a steady growth of the commerce of the country all through the period in question. The growth, however, is not uniform from year to year. In the passenger traffic we find that there are three years —1891, 1892, and 1893—in which there was comparatively little growth, while in the goods traffic we find that there was actually a diminution between the years 1891 and 1893 from £43,231,000 to £40,994,000. There is no doubt that about the period in question there was some depression of business as the result of the Baring collapse, and in studying questions as to industrial growth over long periods, figures like these, of which many examples could be given, are most instructive. In connection with changes in the money market, which will be the subject of a later chapter, such figures appear to be specially significant.

In a practical sense the figures which are most useful in business relative to railway working are those of the weekly estimates of traffic which are published, and which are keenly scrutinised by those concerned from week to week. It is unnecessary here to give any specimens, especially as they are made familiar by references not merely in the financial press of the country, but in the money articles of all the daily newspapers. Every week in these money

articles there is a record of the weekly estimates of traffic of all the leading railways of the United Kingdom, as well as of the principal foreign countries, and to a careful student there is no better barometer of the oscillations in business, the estimates rising in good times and being either stationary or falling off when times are depressed.

Having given these figures, mainly as examples and illustrations of how railway statistics can be used, we find it hardly expedient to deal at any length with the statistics of railway enterprise in other countries. Like causes produce like effects, and while the variations between country and country will be useful to the railway expert, they are not so necessary to the ordinary student of statistics, who should be content in a general study to understand the principles guiding the use of the statistics so that he can follow up the matter from original sources as far as he may find necessary for any particular purpose. We may present, however, the following general table, giving an idea of the magnitude of the railway system throughout the world:

[TABLE

TABLE SHOWING THE LENGTH OF RAILWAY LINE AND THE GROSS RECEIPTS OF RAILWAYS IN THE UNDERMENTIONED COUNTRIES IN 1897, OR THE FINANCIAL YEAR NEAREST THERETO.

	Length of line open 1000 miles.	Gross receipts. Millions sterling.
United Kingdom	21·4	93·7
British India[1]	21·0	16·3
Australia and New Zealand	13·7	10·4
Natal	0·4	1·1
Cape of Good Hope	2·3	3·1
Canada	16·6	52·3
Russia in Europe	23·3	46·2
German Empire	29·2	83·9
France[2]	22·9	53·5
Spain	8·0	8·7[3]
Italy	9·7	11·2
Austria	10·8	23·1
Hungary	9·8	10·3
United States	184·4	259·8
Argentine Republic	9·2	5·0
Japan	2·9	2·8

[1] Including railways belonging to the Native States but excluding the foreign lines.
[2] Lignes d'intérêt général only, excluding local lines.
[3] Traffic receipts only.

It will be understood that the mileage here stated is that of mileage in the sense above explained, viz., the distances between place and place covered by a railway connection of some kind. The difference which we have found to exist between a mile of railway in England, Scotland, and Ireland is equally exemplified in the mileage of railways when we compare one country with another. It will be seen, in fact, from the second column of the table, which deals with the receipts of the railway companies, that the differences between mile and mile in different countries

of the world must be enormous. Some stress should also be laid on the fact, apparent from the above table, that the United Kingdom occupies no more than a second place among the countries of the world in regard to railway enterprise, the position of the United States in mileage and income being far superior ; whereas in the United Kingdom the mileage is 21,000 only, in the United States it is 184,000, and whereas in the United Kingdom the receipts from railways, as we have seen, are barely 94 millions sterling, they amount in the United States to 260 millions nearly. Other countries, such as France, Germany, and Russia, are also ahead of the United Kingdom in regard to mileage, though not yet in regard to receipts, but even in receipts it is not unlikely that a country like Russia, with such vast distances to cover, will before long exceed the United Kingdom, just as the United States does. One cannot but anticipate the most important developments from the extension of railway communication throughout the world. It is in continental countries, and not in an island country like the United Kingdom, where this communication will be most important for business, and in this sense we may say that the world is yet little more than in its infancy as regards railway communication. In the next twenty years the aspect of things must be altogether transformed, even from what it is now. We may expect by that time that considerable advance will have been made towards a network of communication connecting the whole of Europe with the remotest parts of Asia,

and connecting the whole of the two continents of America, if not also connecting Africa, north and south, and east and west. There are even projects, I believe, for connecting the northern continent of America with Asia, with only a short break at Behring Strait.

The greatest differences, it may be added, are observable in the accounts of the railway systems of different countries as regards the proportion of expenditure to working receipts. Generally in new countries, chiefly we may take for illustration the United States, the proportion of expenses to income is higher than it is in the United Kingdom. The explanation of this difference is no doubt partly the difference between the capital expenditures in different countries. In the United Kingdom, where capital has been abundant and every appliance has been made use of, for making a perfect permanent way, and for having stations fully equipped, there is a necessity for not having too large a proportion of expenditure to income in order to provide sufficient net earnings for the interest upon the capital outlay. In other countries, where the need for railway communication of some kind has been very great, and the difficulty of obtaining capital has also been great, the work in establishing the railway itself has been rougher, and so the current expenditure in earning the income is larger, while the proportion of net earnings required to pay interest on the capital outlay is less.

It will be convenient to notice at this point the

statistics of railway accidents which have been referred to at the beginning of this chapter. It is somewhat difficult to find a proper place for the statistics on this head, as it was with the corresponding statistics of wrecks and loss of life at sea. They belong to the records of railways generally, but the subject matter is not directly connected with the topics which we have been discussing as to the profits of railway enterprise and other points in the working of railways. It may be convenient also to discuss the subject more fully afterwards, in connection with that of accidents generally. Meanwhile, we notice that railway accidents are recorded statistically for two purposes, one not altogether unconnected with production itself. It is clear that part of the cost of working a railway, however small a part, must be due to the accidents which occur and which are the cause of the destruction or partial waste of rolling stock and permanent way. The number of accidents then which occur either to the permanent way or to the rolling stock in the course of working a railway system, becomes a matter of considerable interest to those connected with the working of railways, whether as shareholders or the Government. The two items of working expenses which have been referred to, viz., compensation for accidents to goods and compensation for accidents to passengers, are clearly connected with this part of the subject; but the items of compensation themselves do not fully show the whole cost to railway companies of the accidents which occur, so that some consideration

requires to be given in addition to the number of accidents themselves. According to the latest returns to the Board of Trade the accidents which occurred to trains, rolling stock, and permanent way on the railway systems of the United Kingdom in the latest year, 1897, numbered 1387; but even this figure, we should apprehend, does not include, as far as we can judge, all the accidents which happened to the stock or permanent way and which necessitated repairs. It includes mainly accidents actually occurring in the working of trains, and a considerable number of accidents among them more or less injurious to life and limb, but not very destructive to the rolling stock or property of railways.

The other object which is mainly kept in view in railway accidents is what may be described as the humanitarian one or social one. Here it is intended by the public to keep a strict record of what befalls either the people employed in working the railways in connection with their business, or the passengers who are conveyed. According to the returns to the Board of Trade which have been already referred to, the security of railway passengers against accident is now very complete. In the last five years the numbers of passengers killed and injured, from causes beyond their own control, from accidents to trains, have been, on the average, 12 and 388 respectively; while the number of passengers' journeys, exclusive of those made by season-ticket holders, has averaged 945 millions per annum. Accidents to passengers on railways are accordingly very few. The figures for

deaths and injuries are, it must be remembered, very variable ones. Chance determines to some extent the number of people who may be affected by an accident; still, the cases of injury or loss of life to railway passengers, as the result of the accidents to the trains in which they are travelling in the course of their business, could hardly be so few as they are unless the accidents themselves were really few in number.

But while the security of railway travelling is thus very great so far as the passengers are concerned, there appears to be a serious amount of injury and loss of life to those concerned in the working of the railways. For the last five years the number of railway servants killed in accidents to trains or from other accidents connected with the movement of railway vehicles has been on the average 453, and the number of railway servants injured has been on the average 3003. In one sense it may be allowed that these are not startling figures. The total number of railway servants, mainly employed on the permanent way, or as guards, and engineers, and stokers in working the trains, or as porters connected with the service of the trains at railway stations and sidings, is over 400,000, so that the proportion killed or injured in accidents cannot be considered a very high one. Still, the aggregate numbers are considerable, and mount up in a few years to a sensible proportion of all those engaged in working the lines.

The proper use of these statistics, therefore, ought mainly to be in connection with the general question

of accidents, and specially of accidents to working-men in following their occupations. They are to be compared with similar statistics respecting the loss of life at sea and injury to those employed at sea; respecting the loss of life and injury to those employed in mining, in factories, and in other employments; and with the loss of life or injury occurring through accidents generally, and not in connection with those particular employments which are more or less dangerous, and, being on a great scale, attract considerable attention.

Leaving the question then of railway accidents for the present, we propose at a later stage to take up the question of accidents in a general and comparative manner.

CHAPTER X

TRAMWAYS, GAS, ELECTRIC LIGHT, WATERWORKS, ETC.

In addition to railways there are a certain number of enterprises connected with production, more or less under the control of the Government, which have not, in the aggregate, the importance of railways, but which are of undoubted interest to the whole community. Amongst the principal of these are to be classed tramways, which are themselves very much in the nature of railways, though they have not attained the extension which has been given to railway enterprise. Canals, again, preceded railway enterprise, and were at one time extremely important, and are still of some value, although in the competition with railways they have gone to the wall and have not the importance which they once had. Even more important, however, are perhaps the undertakings of companies or of local authorities themselves for the supply of gas. To these must now be added, owing to the increase of the business in the last few years, the undertakings of electric light companies to supply electric light, and the similar undertakings of local authorities. The undertakings of

water companies are also extremely important. A short account, therefore, of the nature of the statistical information to be obtained on these subjects appears to be called for.

The source of information respecting the tramway companies is very much the same as that of railways. The tramway companies' accounts are subject to the supervision of the public authorities in the same way that the accounts of railways are subject, and the tramway companies and the local authorities performing the service of tramways are liable with the railway companies to make returns to the Board of Trade which are afterwards condensed and published. In 1897–98 the number of tramway undertakings in the country was 163, with an aggregate mileage of 1064, while the gross income received from them amounted to 4·6 millions sterling. This latter is a very small figure, of course, compared with the 90 millions or thereabouts of the gross income of railways, while the capital of the tramways, 15·9 millions, is also quite insignificant compared with the thousand millions sterling and upwards of the railway companies. But the business is one which may increase, just as that of railways did.

As to canals, there is unfortunately a great lack of information, owing to the way in which the business has been encroached upon by railway business proper, as already explained. There is also a great lack of regular returns upon the subject of canals. According to the latest special returns which I have been able to notice, the total mileage of canals in the United

Kingdom is 3813. But it is quite impossible to give any account of their working separately, as they are frequently part of the railway undertakings, which have not merely competed with them but have absorbed them.

As regards gas undertakings, the information is better. The accounts of the gas companies have to be furnished for the most part to the Board of Trade on a common form, the exceptions being mainly those of the metropolitan gas companies, where, however, the Board of Trade has power to appoint an official auditor, and the result of his action is that the forms used by the metropolitan companies are much the same as those of the other companies which are directly prescribed by Act of Parliament. From a summary of these returns at the end of the annual volume issued by the Board of Trade, it appears that the total capital engaged in gas undertakings in 1897 amounted to 78·6 millions, while the gross receipts of the companies or local authorities amounted to 20·2 millions, and the expenditure to 15·0 millions. These again are much smaller figures that those connected with the railway companies, but nevertheless show an interest of considerable amount. The net earnings in proportion to capital are also not much greater now than they are in the case of the railway companies themselves, the business being clearly of a kind that is attractive to the quiet investor, who desires good security and no great speculative risk. Roughly some two-thirds of the undertakings, with the same proportion of the total capital, are in the hands of commercial companies.

The business connected with electric light is much newer, but already there are a considerable number of electric supply companies and undertakings in existence, the number of such concerns in 1897, according to Garcke's *Manual of Electrical Undertakings*, being 58 companies with a capital of 6·6 millions, and 57 municipalities with invested capital 3·5 millions. In a short time it is probable these companies may even exceed in number and importance the gas companies themselves.

Waterworks appear to be much more important in many ways. An important distinction between such enterprises and those of tramways or gas and electric light or railways, is that while the latter make their charges to the public in proportion to the service rendered, the waterworks undertakings, both those of companies and those of local authorities, are remunerated very largely, not by a direct charge to the consumer, but by a rating charge almost in the nature of a tax upon the property of the districts which receive the water-supply. At this point, then, we come upon one of the topics of State and local finance. It does not appear to be possible to give a figure for the total capital engaged in water undertakings in the United Kingdom, but it may be mentioned that the total capital of the Metropolitan water companies appears to be, from the latest returns for 1897, about 16 millions sterling, and that the aggregate income is over 2 millions; but it will be understood that this aggregate income is not earned in quite the same way as the aggregate income of rail-

way and tramway companies, etc., but is derived to some extent from what is, properly speaking, taxation. In the water undertakings carried on by Municipal Boroughs (Return 88, 1899) a capital of over 48 millions is engaged, and the gross income is $2\frac{1}{2}$ millions.

I do not propose to enter into detail with regard to the workings of the different kinds of enterprises mentioned in this chapter in the same way that particulars have been given respecting the working of railway enterprise. The mileage run on tramways, for instance, the gross receipts per mile run, and the expenditure per mile run, together with the proportion of the total expenditure to the total receipts, are obviously all matters of interest to those concerned, in the same way that similar matters are of interest to shareholders and the Government with respect to railway companies. It is sufficient to indicate that there are similar points for inquiry and consideration, and it would encumber a work like the present to give the same detail for businesses which are comparatively less important. Similarly as regards gas undertakings, a great amount of detail could be given which would be most interesting to those specially concerned with the work of gas companies. The points here are the proportion of coal consumed per thousand or per million cubic feet of gas manufactured, the gross expenditure for coal reduced to a similar proportion, and also the net expenditure after deducting the amount received for by-products, such as coke, tar,

ammonia, etc. The different items of expenditure in making the gas, principally the expenditure on coal, gross and net, as already mentioned, are also capable of being worked out as so much per thousand cubic feet, from which it would further appear how much of the amount paid by consumers for their gas per thousand cubic feet goes to remunerate the capital engaged in the undertakings after paying all expenses. From a work issued by Mr. Field, the Secretary and Manager of the Gas Light & Coke Company, I extract the following particulars on these heads of some of the principal companies in the Metropolis and throughout the country:

INCOME RECEIVED BY VARIOUS GAS UNDERTAKINGS FROM SEVERAL SOURCES, IN PENCE PER 1000 CUBIC FEET OF GAS.

	Net gas rental.	Meter and stove rental.	Rents and miscellaneous receipts.	Total residuals (including coke and breeze).	Total income, less public lamp charges.
Metropolitan Companies—					
The Gas Light . .	33·34	0·32	0·10	7·10	40·86
Commercial . . .	29·87	1·07	0·06	7·09	38·09
South Metropolitan . . .	26·73	1·61	0·09	7·54	35·97
Provincial Companies—					
Liverpool . . .	32·78	0·86	0·04	5·12	38·80
Sheffield	23·20	1·28	0·21	8·98	33·67
Bristol	27·90	0·83	0·07	7·62	36·42
Newcastle . . .	19·72	1·01	0·15	5·35	26·23
Provincial Corporations—					
Birmingham . .	26·43	...	0·30	4·63	31·36
Manchester . . .	28·19	0·30	0·02	5·37	33·88
Glasgow	25·96	...	0·05	5·80	31·81

These particulars are sufficient to illustrate the value of the means which statistics put into the hands of those concerned with accounts for making comparisons and for showing results which are interesting to the public in every way, seeing that gas companies, like railway companies, have a practical monopoly which it is the right of the public to control. By an arrangement of long standing, as is well known, the gas companies of the Metropolis have a sliding scale by which the rate of dividend is permitted to increase for every reduction that is made in the price of gas per thousand cubic feet. The study of such particulars, therefore, is one with which the public are always concerned.

With regard to water undertakings, it is even more difficult to give similar particulars, because the receipts of the companies and of the undertakings, as already explained, are not derived for the most part from a charge for the service rendered but from a rating charge upon the property within the district which the water companies serve. Still, there are such particulars as the number of gallons of water supplied per inhabitant in the district served, the total cost of the supply, and the amount actually received by the companies in respect of the supply reduced to so much per thousand and so much per million gallons. The following particulars on these heads as regards the Metropolitan companies are extracted from the report of the Local Government Board :

PARTICULARS AS TO THE SUPPLY OF WATER BY THE METROPOLITAN WATER COMPANIES IN 1897.

Company.	Total supply in thousand million gallons.	Average number of houses (thousands) supplied throughout the year.	Average population (thousands).	Average daily supply (gallons).	
				Per house.	Per head.
Chelsea . . .	4·5	37·6	277	327	44·4
East London .	15·0	190·6	1262	215	32·5
Grand Junction	7·1	61·5	398	318	49·0
Kent . . .	5·7	85·4	512	181	30·2
Lambeth . .	8·6	106·9	667	221	35·5
New River . .	13·1	162·3	1176	222	30·6
Southwark and Vauxhall .	12·3	120·6	809	280	41·7
West Middlesex	7·4	81·3	602	250	33·8
Total . .	73·8	846·1	5703	239	35·4

These figures, it will be understood, are given merely as illustrations of the kind of utility which statistical figures have in connection with this business, and it would of course be impossible to go into the subject with the minuteness which water engineers and members of public bodies engaged in, and controlling water companies find it necessary to do.

Of late a vast amount of statistical inquiry and study has taken place respecting the subject of water-supply. The possibilities of adequately supplying the great collections of human beings which are found in modern cities, and especially the possibility of supplying the inhabitants of the Metropolis, comfortably and adequately, are naturally becoming of extreme interest as the populations

themselves grow. Cities like Glasgow, Manchester, and Liverpool in this country, and Paris and New York in foreign countries, have gone to great distances or considerable distances in order to obtain a supply of water for the accumulation of human beings upon a narrow space, in some cases competing with other districts and other cities for the common supply. The statistics here required are the amount of rainfall in a particular river district from which it is proposed to take the supply; the amount of storage that will be necessary and the amount of water that must be left in the rivers for all the purposes that are required, irrespective of what may be called the new demand made upon them for the city which is taking the supply. As regards London and the Thames Valley, the problem is now how long the supply in the Thames Valley can be reckoned upon, allowing for the natural growth of population, and how much the possibility of a supply from Wales, which is the distant mountain country possibly available for the purpose, can be depended upon in the future. The London County Council have committed themselves to the idea that an early recourse to the supply from Wales may be necessary, while an opposite view, largely supported by the water companies themselves, is to the effect that the Thames Valley and other sources can be depended upon for more than thirty years from the present time, and possibly for a longer time if the population of the Metropolis should from any cause cease to grow as rapidly as it is now doing. The heat and

passion infused into the contest make it very difficult for impartial persons even to form conclusions on the matter. All that one can do here is to point out that the whole subject is a matter for strict and mathematical statement. How much can be obtained from the area of the Thames, what the possibilities of storage are, and at what expense, are not matters for polemical controversy but for strict calculation. Equally the number of gallons required per inhabitant for a constant and sufficient supply is a matter primarily for engineers, but also for the common sense of the local authorities who have to supervise the engineers. But given the data of the supply on the one side and the requirement on the other, there ought to be no room for heat and passion in deciding as to the possibilities. Similarly, the possibilities of the Welsh supply should be treated in a like manner, care being taken adequately to ascertain the rainfall of any district proposed to be selected, and then to calculate what the storage must be and what the whole expense of storage and of conveying the water to London. Those who care to follow the matter further will have only too ample material in the shape of reports of Royal Commissions, of Committees of the House of Commons on Water Bills, and of voluminous reports and discussions in the London County Council and in the Press. Statistically, however, the points to be considered are not so very numerous, and the wonder is that some sort of agreement is not speedily arrived at among the disputants.

It is a subject of more importance how far the

permanent difficulty of providing a water-supply for the inhabitants of great cities, which are continually growing, is being sufficiently considered in the public interest. Those who follow up the subject will find that some of the figures as to the possible water-supply are of rather an alarming kind. The mere fact that the inhabitants of London and of the Thames Valley may find that the resources within their own water-shed are exhausted by the year 1931, which seems to be very commonly allowed, is of rather an alarming nature, while the statements as to the addition likely to be made from Wales are not of a very reassuring kind. If the whole possibilities of the Thames Valley have been exhausted by the year 1931, then the addition from Wales, being only a small addition by comparison with the great supply possibly obtainable from the Thames Valley, is likely itself to be exhausted in a very few years after the date 1931, mentioned as the probable term for the exhaustion of the supply of the Thames Valley itself. Similar difficulties are, no doubt, being encountered in other cities and towns all over the kingdom, while the like difficulties are encountered in Paris and other cities of the Continent. The difficulty is intrinsically of much the same character as that which has been already referred to in connection with the approaching insufficiency of certain crops like wheat for the supply of all the demands upon them. It is not to be assumed that there is very much in the apprehension itself that there will be an absolute failure of supply at the future dates mentioned. The point that such

comparisons bring out always is that an important change of conditions is approaching, and that the study of such changes ought to engage the attention of those concerned, in order that people may adapt themselves to and make provision in other ways for the new circumstances.

CHAPTER XI

FINANCE

We pass by a natural transition from the study of the statistics of population and of the statistics of production and trade to those which have reference to public finance—the finance of Governments, and the finance of the subordinate governments called Local Authorities. In the statistics of population we are concerned with the life of man in communities, with the human beings themselves. In the statistics of production and trade we are concerned with the means by which a living is made, with man, that is, considered as an economic force. Now in the statistics of finance we are concerned with the matters affecting mankind, in the most important of their social relations; that is, the relation of Government and the organisation of communities, not merely for the preservation of social order but for the promotion of other ends which they have in common, and in which it is most convenient for the Government to have the task of doing what the community requires.

The objects of the statistics of finance may be very simply stated. Finance itself is, of course,

indispensable to governments or administrations of any kind. Accounts have to be kept of what is received and expended, and these accounts have to be in such a form as to admit of careful audit and supervision. It is at this point the use of the statistical method comes in. Experience has shown that the arrangement of accounts in such a way as to be easily audited and supervised is one which both lends itself to statistical uses and which calls in the aid of statistical arrangements. In audit and supervision it is obvious that one of the most important things is to have ready means of comparison as regards any particular item with previous years; ready means of comparison between different items themselves; and, of course, ready means of comparing the changes of corresponding items in relation to each other in different years. When accounts are presented in this way, those who audit and supervise have their attention at once called to material points. They can see at once, for instance, whether the general expenditure is growing and in what direction; they can see at once whether a particular source of income is increasing or diminishing, and immediately inquire the why and wherefore of the change; they can see at once also whether a particular item of expenditure is increasing or diminishing, and again inquire the why and wherefore of the change. All this easy means of comparison is obtained by means of the arrangement of the data of the accounts in a statistical form.

It may be said, therefore, that one of the principal objects of statistics in connection with finance is to

facilitate the study of the accounts by those interested. It may be stated broadly, in fact, that there cannot be good public accounts without the arrangement of the accounts in such a way as to facilitate their statistical use.

The arrangements which are thus found convenient for the supervision and audit of the accounts themselves are essential, in the next place, for the more important purpose of conveying to those interested the information on material points which they desire. Apart from the uses of such figures for checking the accounts themselves, those who are interested in public accounts of any kind find the information as to the growth of income and expenditure, and the growth or the reverse of particular branches of income and expenditure, the very thing which they wish to know most of all as regards the public accounts. Why the Government or the subordinate authorities are receiving or spending more or less are clearly the points to which in the study of public accounts the attention of all concerned should be directed, and these are matters as respects which information can only be given by statistical comparisons. Accordingly the finance of governments and of local authorities must become the subject-matter of statistics as soon as these subjects engage public inquiry and discussion at all.

This is not the whole matter. The relative growth of income and expenditure has also to be considered in comparison with the means of the community generally, and with reference to the

particular source of a given part of the income and the particular object aimed at by the expenditure. The growth of the taxable *corpus*, that is, of the possible as well as the actual sources of the income, has also to be considered. On this latter head the statistics are clearly connected with those relating to the production and trade of the country. But a new kind of statistical work has to be applied in order to understand fully what the taxable resources of a country are. The statistics of production and trade have themselves to be reviewed in a general way, and cast into a new form so as to bring out results in the aggregate. For other purposes these aggregate results are necessary and required, and they appear to belong to the statistics of wealth and accumulation which constitute a different part of our whole subject. But to some extent such statistics must be taken notice of at this stage in connection with the general problems of State finance.

The data of financial statistics, except as regards those statistics which relate to taxable income and capacity, are undoubtedly among the best that could be obtained for any statistics. As is the case with the data of railway statistics, the figures in the accounts, which are the basis of everything, are themselves contentious figures, subject to supervision and audit, and on a great scale the materials may be considered for all practical purposes absolutely trustworthy. Errors may creep in here and there, and there may be absolute falsification through the mistakes or treachery of particular

officers, but in communities where there is much public spirit and honesty, the errors thus arising must obviously be quite insignificant. If mistakes arise in using financial statistical data, it will not be that the data themselves are wrong, but that they are wrongly interpreted. With regard to that portion of the statistics, however, relating to accumulation and wealth, these remarks do not apply. Here, as we shall find, the difficulty of making statistics from data which have to be brought together and interpreted, is very considerable indeed.

While the data of financial statistics themselves are thus generally trustworthy, the dangers of interpretation and compilation are very great. Take, for instance, such a question as that of the income of the State. This may seem to be an easy matter, but as a matter of fact we find that there are various definitions. There is more than one point on which differences of opinion arise among those who put financial statistics together—there is the question whether the income of the State, to be dealt with mainly in financial statistics is the income derived from taxation; and then there are further questions as to what taxation means. Questions arise, for instance, as to whether the income from such a business as the Post Office is taxation or not, or whether merely the net income from the administration should be considered to be the taxation raised in that way. It is easy to see, therefore, that quite honestly people who give the statistics of the income of a Government may vary considerably in what

they say, and that at the very threshold accordingly in compiling financial statistics we are met by the most serious difficulty—not from any doubt as to the truth of the figures, but from questions which arise as to the meaning to be put upon them. Having considered the matter a great deal, I am of opinion that some of the practice of State and financial authorities in publishing their statistics is not to be justified. The first figure which ought to be given in all financial statistics, in my opinion, is that of the gross income administered by a Government, no matter from what source derived, whether it is called taxation or not. If the Government carries on a business such as that of the Post Office, or, what is still more important, the business of railways, then the figure of the whole income of the State ought to include such gross income. It may be the case that in comparison with other countries as showing the relative burdens, it would be desirable to state the income of the country in a narrower way; but it is important, nevertheless, to show all those concerned in the finance of a particular country the proportion of the whole income of a community which a Government administers, and whether it receives that income from rent of property or from the carrying on of a business like that of a railway, or from the carrying on of a business like that of a Post Office, or from taxation; it is essential that all concerned should see how much income is received and spent by the Government. Of course in all accounts there are many formal and cross entries,

but saving these, it is essential in my view that the gross income of a State or of a local authority should always be shown in its accounts and statistics.

The subject as regards accounts themselves was fully investigated by a Committee on Accounts which sat in this country in the 'twenties, when the conclusion was definitely, and I should have hoped finally arrived at, that the system which had been established in France should be applied in this country, viz. that of showing on the one side the gross income of the Government and on the other side the gross expenditure. I am sorry to say that of late years the practice of the English Government and Parliament has not been so good as that which was laid down by the Committee which sat seventy years ago. Under the pressure of party ministers and governments, each of which has been anxious from time to time to make it appear on the face of the accounts that there has been no growth of expenditure to be put to their account, means have been taken to diminish the gross expenditure upon the one side and the gross income on the other. As regards certain services where fees are received from the public for services rendered, for instance in law proceedings, it has been asserted and laid down by financial authorities that instead of the whole money for carrying on the service being voted and expended and publicly accounted for, it will be sufficient if a Parliamentary grant is made to cover any deficiency in the income received from the public in the shape of fees, and so on, for the carrying on of the service.

The result is that the total expenditure of the Government now shown in the finance accounts, and the general statistics based upon them, is no longer a true figure, but certain things are exempted which ought, in my opinion, to be included. The same remark applies still more forcibly to certain accounts in which a distinction is attempted to be drawn between tax and non-tax revenue, and in which the resulting charge of the expenditure of the Government to the taxpayer, deducting from that expenditure receipts from other sources and taxes so-called, is attempted to be brought out. All these comparisons when made may be more or less interesting, but nothing would have been so useful as the first figures of all—the gross income on one side, however arising, and the gross expenditure on the other side, however caused.

Other distinctions are necessary in dealing with the accounts and statistics. Besides the difficulty already mentioned of distinguishing what is income from taxation, there are various difficulties caused by the distinction between local and Imperial finance itself. The income which appears in the one set of accounts sometimes appears in the other set, contributions being made from the Imperial Government to local finance, and so on. A question also arises as to whether the income of the Church or other bodies from a source like tithes is to be considered the income of the State or not. Probably the questions are sometimes not so important practically as they are theoretically, but cases of comparison

may arise where the point may have to be taken notice of.

There are also various dangers in compilation when we come to deal with the sources of taxation. The duties upon imports appear simple enough, as the article upon which the duty is levied is definite, and the risk of the statistics being in error arises mainly from smuggling, which need not, however, be an important matter where there is a proper system of duties and a proper organisation of the custom service. Practically in some countries this is an important matter, but it need not be so. The duties of excise again are very simple, as a rule, but difficulties arise in interpretation, for instance, owing to the differences which may exist between the year of levying the duties and the year in which the articles upon which the duties are levied are actually consumed. This is a difficulty that applies to some extent also to the duties upon imports; but in some of the cases of excise duties it may be of greater importance than with regard to import duties generally. As regards excise again, in studying the statistics it may be found that there is a great difference between the annual production of the article subject to duty and the annual quantity which does, in fact, pay duty. An illustration of this may be found in the statistics published by the Inland Revenue Department in this country, which show a continual increase in the stocks of spirits held in the country along with a continual increase in the annual consumption, indicating that there is a steady

production in excess of the annual consumption itself. Clearly then, those who study such statistics should beware of treating the increase of production in such a case as if it were an increase of consumption. Even greater difficulties appear in some other Inland Revenue data. The returns as to the income-tax especially are full of pitfalls. It seems necessary to distinguish between the amount of tax actually paid in a particular year, and the amount of the tax actually charged for the same year, the two things not being the same. In a given financial year a part of the tax paid is not in respect of the current year, but is received in respect of previous years, for which it was assessed, while the actual receipt of the year may be diminished by the return of tax overpaid in respect of previous years. The complications are thus considerable, especially as there is a very considerable margin of overcharge in the assessments habitually made in connection with the income-tax upon the profits of great public companies like railways, the capital of which is held by thousands of individuals. These profits are charged, in the first instance, by the Department to the railway companies themselves, and appear as so much charged in some of the statistics, although it is quite well known that great repayments will have to be made to persons who are either not liable to the tax at all, their income being below the minimum limit, or to persons who are entitled to considerable abatements through their incomes, although above the minimum limit liable to taxation,

being still below the higher limit which entitles them to abatements of some kind. Practically the difference between the gross assessment of income to the income-tax and the net amount which finally pays duty appears to be very nearly one-third, and this is a difference which may give rise and does give rise to no small difficulties in dealing with the statistics. The statistics relating to probate and succession duties again are really very difficult, as may be seen from the fact that hitherto the amount of property passing at death, which it would be thought is one of the first figures at which the Department and the public would wish to arrive, has never been stated in the accounts. The figure stated has been that of the property actually paying duty in a given year, so that where a duty has been payable by instalments, as was the case and is still the case with the succession duties, the property stated as paying duty was in some cases no more than an eighth or less of the property known to have passed at death. The first figure that ought to be shown in place of the value of the property actually passing at death within a given year, which is a figure that might be very difficult to establish, owing to the cases in which the Department itself does not get information perhaps for some years afterwards, should be, I believe, the amount of property in respect of which duty of any kind was first paid in a given year, so that the Department had notice of its passing at death. Such a figure, I believe, would be quite as good for all practical purposes as the figure of actual

property passing at death, and it would not be liable to the exception which can be taken to the figure of the property actually paying duty, which is too largely dependent on mere departmental arrangements. Other points arise in connection with the interpretation of the figures of the probate and succession duties, now the Estate duties, but the above are the main points which must be taken notice of at this stage.

All these figures as to sources of taxation, of course, supply data of more general interest as well as of special financial interest. We are interested in the figures as to income-tax and property passing at death very largely from the point of view of the welfare of the whole community. But the primary object with which they are supplied, viz. for the purpose of administering State finance, is none the less extremely important.

Difficulties arise again in the compilation of financial statistics with regard to certain distinctions that are made between different sorts of taxes. The most common of these distinctions is that between what are called direct and what are called indirect taxes. In their original meaning these words direct and indirect appear to have been used in the sense that direct taxes are assumed to be taken from the person upon whom the burden of the tax also falls in the last resort, and that indirect taxes are paid by people who are able to pass on the charge to others, so that the first incidence of the tax is not the same as the ultimate incidence. The characteristic direct tax

in this view is considered to be the income-tax in this country and such a tax as the land-tax in France and other continental countries. The characteristic indirect taxes are considered to be those upon articles imported or exported, called the duties of the Customs Department, and those upon articles produced and consumed within the country, called duties of Excise. It is plain, however, that the question may arise whether such a distinction is in itself altogether a good one. Even as regards indirect taxes, such as those of customs and excise, it may be the case that frequently when a charge is made those who pay the duties in the first instance are not able to pass on the charge directly to other members of the community, and consequently the incidence of these indirect taxes is partly upon those members of the community who pay them directly to the State. It was considered, for instance, with reference to a recent increase of the beer duty in this country, to be extremely problematical whether the trade would be able to pass on the charge to the rest of the community, and would not rather be compelled to pay the extra charge out of their own pockets, their profits being diminished by so much. Many years ago, in Italy, a case of the same kind arose. A tax called a "multure tax" was imposed upon the grinding of corn in Italy, but it was observed at the time that the price of flour did not rise in any way. The whole amount of the duty appeared to be defrayed by the trade, and those who paid it were, in fact, reimbursed by the kind of monopoly which they enjoyed, and the

diminution of competition in the trade in consequence of the great amount of capital required to carry it on under the conditions of the tax. Broadly, of course, it may be considered, in spite of these exceptions, that such indirect taxes are passed on to and become a charge upon the whole community, and are not really borne to any material extent by those particular members of the community who actually pay them to the tax-gatherer. But the exceptions appear nevertheless important enough to require occasional consideration. The difficulties about the so-called direct taxes, or some of them, are even greater. I do not think it can be affirmed that in all cases a direct tax, such as the land-tax in France and other continental countries, falls upon the people who actually pay it. There is an old tax in England, called the land-tax, where undoubtedly in very many cases the persons who pay it cannot be said in so doing to contribute out of their own pockets so much to the necessities of the State. The tax having been in existence for generations, and not being one which falls generally upon the income of the community, those who have dealt with the property affected by it have been able to treat it, in comparing their investments, as a charge upon the property itself. In considering the property as a subject for investment they are able, in the first instance, to deduct the amount of the tax and then compare the net income which the property appears to yield with the net income which they are able to derive from other investments. It cannot be said then, in any proper

sense of the word, that they pay the tax as other tax-payers pay their taxes. The Government in this case has really carved out a portion of the property for itself, of which it is as much the owner as any person owning a rent charge upon the same property ; and those who pay the tax are no more entitled to complain of a burden upon themselves than the mortgagor of a property is entitled to complain of the burden of the interest which he pays to the mortgagee. In other words, then, the land-tax in this country, which is called a direct tax, is not really a tax at all.

The land-tax in this country is not a tax now of great moment, but there are other taxes called rates, forming part of the income of local authorities, to which largely the same principles appear to apply. Rates, as every one knows, are an extremely important source of income to the local authorities in this country. They are charged as a rate to the occupier of property, and the ordinary supposition, the assumption in fact at the basis of legislation on the subject, is that they are direct taxes upon the occupiers. As a matter of fact, however, it has been found that the class of occupiers, as a rule, while complaining greatly of the rates, do not act as if the incidence of the rates ultimately fell upon them. This is notoriously the case as regards rates upon houses everywhere, and especially in the Metropolis, where the rates amount to a large sum of money. In the midst of all the outcry about the rates, occupiers see that any modification which might be made would practically benefit them or injure them to a comparatively immaterial

extent. They feel that as the rates go down the rents might go up, and so they are not really interested in any change. On the other hand, the owner of the property in respect of which the rates are assessed upon the occupier, continually complains, and I think with some justice, that he really pays the rates and not the occupier. Assuming it to be true that if rates increase he will be able to charge less rent, he recognises that the rates which are assessed upon the occupier are really matters which concern him as owner. My own opinion is that even the owner, though the charge in one way may be represented as falling upon him, does not bear the burden of the rates in the sense in which a taxpayer bears the burden of taxation. The rates come, in fact, to be a deduction from the property of the same kind as the deduction made by a land-tax. But apart from opinion, I am only concerned to establish here the difficulties which arise as to one of the common distinctions made in taxation, and which must affect all statistics where the distinctions are made or attempted. The confusion existing in English finance owing to the want of clearness in handling the question of the incidence of the taxes is, in truth, indescribable.

It may be concluded then that the difficulties in the way of handling the statistics of finance, notwithstanding the certainty of the original data themselves, are very great indeed. Many questions cannot be touched without raising the most formidable difficulties of definition and arrangement.

Some of the principal features of the finance of

governments and local authorities may now be stated in concrete form. The first question clearly is, writing from an English standpoint, the amount of the expenditure and the principal branches thereof, and the amount of the revenue and its principal branches, and the proportions one to the other as well as the proportions of the revenue and expenditure to the resources of the community. Stated then in the most general way, the Imperial revenue for the financial year 1897–98 is found to stand at the sum of £106,614,000, while the total expenditure is put down at £102,936,000. At the threshold, however, we find the very difficulties in detail which we have already referred to generally. These figures are not the gross income and expenditure of the State. The Table of Revenue excludes, according to a note prefixed to it, in accordance with the system now adopted, the Army and Navy extra receipts and the contributions by India for military charges formerly brought to account as revenue; and it also excludes, I fear, although there is no particular note of it, the receipts from fees in connection with certain law proceedings. On the other hand, the expenditure is subject to corresponding reductions, and the total expenditure given is not even said to be the absolute total, but is only the "total chargeable against revenue." Besides the sum here mentioned, various items were spent in 1897–98 under special Acts, amounting in the aggregate to £2,750,000 or thereabouts. The differences thus made are not perhaps all very material, looking at the magnitude of English

finance generally, but I consider them to be most unfortunate and such as to make the study of English finance far more difficult than it ought to be. Taking the corresponding figures as to the receipts and expenditure of local authorities for 1897–98, the receipts, including £16,600,000 from loans, are £101,600,000, and the expenditure £103,100,000. Putting Imperial and local finance together then, we find that there is a total income of about 208 millions sterling, of which over 16 millions is avowedly from loans, and there is a total expenditure of about 206 millions, not including, however, the various special expenditures by the Imperial Government already referred to not chargeable against revenue.

These are the most general figures of English finance, if we compare them with the figures of population, which may be taken roughly as 40 millions at the present time. We find they show an average receipt and expenditure of slightly over £5 per head; or if we deduct the borrowed money from the receipt, an average receipt of about £4 : 16s. per head. This is, of course, a very large amount, and would only be possible in a rich country. It might appear at first that the expenditure is the truer test of the burden, but against this has to be set the consideration that although there is a good deal of borrowing, as has been stated, upon local account, yet there is also a good deal of repayment of these loans, which does not appear formally in the accounts; and in addition there is known to be a considerable appropriation in the Imperial accounts for the repay-

ment of debt, although the exact amount is nowhere formally stated. The sum of £4 : 16s. or thereabouts may thus be considered to be the annual charge upon the people of this country in connection with their government.

How much is this sum in proportion to the resources of the community? It would carry us too far at present to go into the whole question of the wealth and income of the community. We can merely notice that according to different estimates which have been made, the sum of 1600 millions annually would appear to be a fair statement of the total income of the community, equal to about £40 per head; so that the burden of £4 : 16s. annually upon each individual of the community appears to be some 12 per cent. The Government of this country, in other words, administers that proportion of the annual income of the community. The proportion administered by the Imperial Government appears also to be rather more than one-half, but the local authorities are rapidly gaining upon it. Whereas in 1883–84 the expenditure of the Imperial Government was 86 millions, and has since risen to 103 millions, or 17 millions altogether, we find that the expenditure of the local authorities about the same date was 64 millions, and is now 103 millions, an increase of no less than 39 millions as compared with the 17 millions of increase in the case of the Imperial Government. If we went back still further we should find that the increase in the case of the local authorities has been even more rapid. The

total expenditure of these authorities in 1867–68, when the first complete account was taken of them, amounted to no more than 36 millions, so that the increase since that date has been nearly threefold, while there has been no correspondingly large increase in Imperial expenditure.

Analysing the principal branches of income in the case of the Imperial and local authorities, we find that the gross income of the Imperial authorities may be classified as follows:

CLASSIFICATION OF INCOME OF THE STATE IN THE UNITED KINGDOM, 1897–98.

	Amount. Millions.	Per cent.
Customs	£21·8	20·5
Excise	28·3	26·5
Stamps	7·7	7·2
Estate, etc., duties	11·1	10·4
Land-tax, house-duty, and income-tax	19·7	18·5
Post office and telegraph service	15·2	14·3
Receipts from property, Crown lands, and Suez Canal share receipts, etc.	1·1	1·0
Miscellaneous	1·7	1·6
Total	£106·6	100·0

Thus the gross income of the State is derived as to nearly one-half from the customs and excise duties, which are classed as the characteristic indirect taxes. To these ought to be added the amount derived from stamps, where the incidence is equally indirect and equally difficult to trace to the actual taxpayer. Another large portion of the income is derived from

the post office and telegraph services, which is considered by some not to be, properly speaking, income from taxation, but which in our view is properly included with the gross income of the Government, whatever view may be taken as to the question whether it is, properly speaking, taxation or not. Of the remainder the most interesting items are those of the estate duties and what we may speak of for the moment as the direct taxes, land-tax, house-duty, property and income-tax. The estate, etc., duties would be classed by many as among the direct taxes, but clearly they are subject to the observation that, as they fall upon the dead and not really upon the living, they are altogether in a separate category, and the classification of direct and indirect hardly applies to them. With regard to the other direct taxes, assuming for the moment that they are properly classed as direct, we may say that they supply about one-fifth part of the revenue of the Imperial Government, the remainder being derived from sources partly indirect and partly not in the nature of taxation at all. It is considered by financial authorities that a great change has been passing over this country in recent years in the direction of an increase of the proportion of taxation contributed from direct sources, but this would hardly appear to be the case, at least it is not very strongly the case, unless we include among the direct taxes those from the estate duties or duties upon property passing at death, which hardly seems to be justified.

Analysing the expenditure in a similar manner, we make the following classification :

PRINCIPAL BRANCHES OF IMPERIAL EXPENDITURE IN 1897–98.

	Amount. Millions.	Per cent.
Charge for debt	£25·0	24·2
Civil list and civil administration . . .	23·0	22·4
Army	19·5	19·0
Navy	20·9	20·3
Collection of revenue, including post and telegraph service	14·3	13·9
Expenses under Coinage Acts . . .	0·2	0·2
Total . .	£102·9	100·0

From this it will be seen that the chief burden of the Government is the expenditure for Army and Navy, the expenditure for civil administration being little more than half the total for the Army and Navy. The expenditure for the debt again is subject to two observations. One is that it includes a large amount for repayment, and to this extent it is not expenditure of the community, although it is the expenditure of the Government, the amount thus repaid being clearly a mere passing of money from A to B, one member of the community receiving it and another paying it. This observation is also applicable to some extent to the whole payment of the debt interest; the amount is not a burden upon the community in the same sense that the civil administration and the Army and Navy are burdens. The money passes from A to B and the community is neither richer nor poorer by the payment of the interest, although the fact that the Government has

to receive and to pay it, that it is the intermediary in the transactions, is a material economic fact itself. The charges for the collection of the revenue again, include what is, properly speaking, not a charge for collection of revenue but the expenditure of carrying on a business. 11 millions at least out of the £14,300,000 expense of collecting the revenue are charges of this nature, while the charges for the Customs and the Inland Revenue Departments, which are, more properly speaking, charges for collecting revenue, also include a certain amount for civil administration and not really for collecting revenue. In any case the expenditure of a sum of $2\frac{3}{4}$ millions in collecting so vast a revenue as 106 millions cannot be thought excessive.

The proportion of the Army and Navy expenditure to the income and wealth of the community ought to be noted. A great deal is heard about the burden of military expenditure on modern nations. The subject is continually discussed as if the burden were enormous and modern nations were thereby being ruined. The sum of 40 millions, however, which is the expenditure of the United Kingdom upon Army and Navy combined, is not more than $2\frac{1}{2}$ per cent of the aggregate income of individual members of the community, as above stated. This can hardly be considered ruinous expenditure, and suggests that, as far as this country is concerned, much of the language continually used about armaments and the fearful waste thereby involved, ought to be revised. The fact of waste may be admitted *pro tanto*, but the limits of the burden appear to be narrower than is commonly sup-

posed. I do not propose, however, to enter into the whole subject of the nature and extent of the economic waste involved in military expenditure in this country and elsewhere. The important point, looking at the matter statistically, is the proportion of the waste to the resources of a community, and this should be kept in mind in all discussions.

Analysing the receipts and expenditure of local authorities in the United Kingdom in a similar manner to that already followed with regard to the receipts and expenditure of the Imperial Government, we get first of all the following table as to receipts:

RECEIPTS OF LOCAL AUTHORITIES IN THE UNITED KINGDOM IN 1897–98.

	Receipts. Millions.	Per cent.
Rates[1]	£44·5	43·8
Water	4·0	3·9
Gas	6·5	6·4
Electric light	0·5	0·5
Trams	1·0	1·0
Repayments for private improvements	1·2	1·2
Total for rates, water, gas, etc.	57·7	56·8
Tolls, dues, etc.	7·3	7·2
Rents and sales of property	3·5	3·4
Taxes levied by Imperial authorities and paid over to local authorities	13·2	13·0
Loans	16·6	16·3
Miscellaneous	3·3	3·3
Grand total	£101·6	100·0

[1] In the figure for rates is included a very small amount of receipts for water, gas, etc. undertakings in Ireland.

The principal source of income of local authorities

is thus rates upon real property. If we deduct from the income the amount of the sums borrowed, which of course is not a proper receipt, we find that the rates yield a total of 44½ millions out of a total income of just about 85 millions. Of the other income we find two items which can be considered taxation: first, that of tolls, dues, etc., levied by the local authorities themselves, amounting to 7 millions; second, that of taxes levied by Imperial authorities and paid over to the local authorities, amounting to 13 millions. As regards the former, the taxation to a considerable extent is of such an ambiguous nature that it is sometimes spoken of as not properly taxation, because the sum charged is in the nature of a charge for a service rendered. The greater part of the 7 millions appears, in fact, to be harbour dues, or at least a large part is of that nature, and harbour dues, of course, are charges required for the maintenance of the harbour itself. With regard to the taxes levied by the Imperial Government and paid over to local authorities, there is no doubt that here we have to deal with what is properly taxation. The amounts thus levied by Imperial Government and paid over to the local authorities are of a somewhat miscellaneous kind, consisting of fees for licenses, of a portion of the State duties, such as the Government raises for its own purposes, and of one or two items besides. These payments are substituted for contributions which Government used to make directly and avowedly out of income which was received and directly accounted for by it, but in the manner

in which the transaction is now carried out, the sums so levied and paid over by the Government do not appear in the ordinary accounts of the Government itself. The Inland Revenue Department, however, in its own reports as a department, takes care to specify the whole amount of the income which it receives and pays over to the local authorities, as well as the income which it receives and accounts for to the Imperial Government itself. The question may be raised whether it would not be expedient that the whole of these sums should appear as income received by the Imperial Government. This pertains to the question already stated above as to the importance of showing the gross income of a Government in all the accounts, a point on which my opinion has already been expressed. The expenditure in any case must finally be accounted for in the accounts of the local authorities, with which we are now dealing.

With regard to the rates, various interesting questions arise, according to the view which may be taken of the incidence of the rates themselves. If they are to be considered direct taxes in the nature of an income-tax falling upon the individual persons who pay them, it is clear that the whole burden is a much heavier one than that of the income-tax itself, of which the yield amounted, in the year in question, to 17½ millions. No doubt a portion of the 44½ millions is paid by members of the community who do not pay income-tax, but the greater part, it is believed, also falls upon the payers of income-tax or some of them, so that putting the

two together, the whole charge would be enormous if the taxes, strictly speaking, could be considered direct and falling ultimately upon the persons who pay them in the first instance. The total amount is nearly 62 millions. We have stated, however, some reasons for the opinion that the charge is one which cannot be considered a direct tax in the proper sense of the word, and which is very much in the nature of a rent charge upon the property affected, retained out of the property by the Government of the country for the benefit of the whole community. Looked at in this way, we estimate that the total income from lands and houses assessed to the poor rate amounted in 1897–98 to about 220 millions, out of which the payment of 44½ millions constitutes a deduction of almost exactly 20 per cent. This is not by any means an exact figure, as a portion of the rates is derived from railways in the United Kingdom, but still an insignificant portion compared with the total value of the railways themselves. Substantially the rates are paid out of lands and houses, and this is how the proportion works out. If it be the case that the whole or the greater part of this sum is allowed for by the owners of land and houses in dealing with the property, so that their net income from the property is always calculated after the deduction of the rates, then it may be considered that this portion of the income of the State is derived in an easy manner, and with as little effect in causing a burden upon the community as is possible to any method of raising an income by the State. In say-

ing this I am aware that I am going against very prevalent opinions and preconceptions in the matter, but in any case I am not wrong in suggesting that the very magnitude of this factor in English State and local finance should cause the whole question of the incidence of these rates to be much more fully considered in English politics than has yet been the case.

When we come to an analysis of local expenditure we find that it is hardly possible to give an account of the objects of the expenditure in a condensed form. In the *Statistical Abstract* for the United Kingdom, from which we have taken the figures, the analysis of the expenditure proceeds upon the idea of giving an account of the total expenditure by each description of local authority, and there is no analysis of the objects of the expenditure beyond what an arrangement of this kind of itself suggests. Such an analysis is, however, defective, as not showing the amount of repayment of loans taking place in a given year which will be necessary to set off the income from loans on the other side, so as to show what is the exact amount of expenditure properly so called in a given year. Subject to these observations we may give the following abridgment of the local expenditure as shown in the *Statistical Abstract*:

[TABLE

PRINCIPAL OBJECTS OF LOCAL EXPENDITURE IN 1897–98.

	Amount. Millions.	Per cent.
Poor relief	£13·0	12·6
School boards	12·3	11·9
Town and municipal authorities for police, sanitary, and other public works, etc. . . .	54·6	53·0
County authorities and rural sanitary authorities, etc. . .	11·7	11·3
Harbours, pilotage, and light dues authorities	6·8	6·6
Other authorities, chiefly parochial authorities	4·7	4·6
Total . .	£103·1	100·0

Thus the main expenditure is undoubtedly that made for the general purposes of local government, police, sanitary, and other purposes. The town and county authorities together spend in this way no less than 66 millions out of the total expenditure of 103 millions, and even allowing that a certain portion of these amounts is for the repayment of loans, yet substantially they show that it is local administration proper upon which the money is expended, the common objects of communities in their local association. The sum of 7 millions expended by the harbour, pilotage, and light dues authorities comes almost into the same category, although we may also hold that the light dues themselves are in their nature not very satisfactory taxes. The two other chief items of local

expenditure, however, call for special observation. They are two sums of about 12 millions each, one for the school boards and the other for poor relief. In a sense the expenditure on school boards may be considered to be as beneficial as any other expenditure of town and municipal and county authorities, if not more beneficial. It may be regarded even, from a business point of view, as an expenditure for the improvement of the whole people, by which their earning capacity is to be largely improved. Still, the expenditure is very much under the direction of the Imperial authorities, and at their instigation, and is hardly in the category of local expenditure for such purposes of direct and immediate benefit to the local community as those of drainage, sanitation, and police. The discussion of questions connected with this expenditure belongs more to the sphere of Imperial than to that of local finance. Much the same may be said of the expenditure in connection with the relief of the poor. Although historically this expenditure has been one of the main objects of the existence of local authorities themselves in this country, it is plain that if anything is an Imperial question, that of how to provide for those members of the community who are unfit to provide for themselves, and who are not taken care of by their friends and relations, is such an Imperial question. So much turns upon the method of relief itself in diminishing or increasing the disease of poverty, that it is not one which can be left to the discretion of individual members of the community, such as may come to the

top in local areas and get the administration into their hands. The highest wisdom of the State ought to be applied to the subject. The reasons for this expenditure being left to the administration of local authorities, there is no doubt, are the necessity of having numerous agents all over the country by whom expenditure is to be conducted; and the difficulty of preventing extravagance in any other way than by putting the charge upon the property in the locality, and giving the administration practically to the owners of the property. But if it should now be thought that the force of the central government can be applied to the conduct of the business, then there is no reason why this part of local expenditure should not become Imperial.

It would be very interesting if the usual particulars in the official returns enabled us to say in detail how much of the local expenditure was applied to water, gas, police, drainage, and to other purposes in detail. The sum of 66 millions, above mentioned, is too large to be left without further analysis by those who take an interest in the subject of local finance. Probably also it would be found possible by those who look into the matter to make a further analysis for themselves, but the work in doing so would no doubt be very considerable.

Putting the two sets of figures together it will be found that if we add the 23 millions expended by the Imperial authorities for the civil government of the country, to the amount expended by the local authorities, then the aggregate total expended for the

civil government cannot be far short of 110 millions per annum. The sum so expended by local authorities, deducting amounts applied to the repayment of loans, and making other deductions, cannot be far short of 87 millions, to which the addition of 23 millions will make exactly the sum of 110 millions that has been stated. The miscellaneous objects of civil government are thus well provided for in this country, and the item of 40 millions for military and naval purposes is obviously not the chief amount which has to be considered in dealing with questions of government, however important in itself it may be. If it be true that the civilisation of States is shown by the relative magnitude of their local authorities and the extent of the administration which they command, then it is plain that the government of this country properly stands very high in the scale, an opinion, as we shall see, that will be afterwards confirmed.

Another point of view from which State and local finance may be examined, has reference to the amount of debt incurred. In what way the administrations stand with reference to their past financial management, is always a topic of great interest, although, as we have seen, in this country where the debts are held at home, the matter may not be of the same economic importance as in other countries, where the debts are held abroad. The figures on this head as regards the United Kingdom are comparatively simple. The Imperial debt, according to the latest return, is stated to amount to 639 millions sterling, against which there are assets specially belonging to

the Imperial Government in the shape of Suez Canal shares and Exchequer balances, etc., amounting to 36 millions. At the same time there are about 38 millions of debt for which the Imperial Government is responsible by way of guarantee to local authorities or public bodies, who have borrowed the amount. Strictly speaking, I believe, this sum ought to be added to the National Debt, as it is a debt for which the nation is responsible, and the fact that we have given the guarantee affects *pro tanto* the credit of the State. But the amount is so small in comparison with the aggregate wealth and transactions of the community that the point may be passed over without more remark. The debt of the local authorities again, as appears from the statements in the *Statistical Abstract*, amounts to 299 millions for England and Scotland alone, not including Ireland, as to which no distinct statement is made. Ireland, however, cannot figure for a very large amount, as the borrowing authorities do not exist in Ireland in the shape of town and municipal authorities, in the same proportion as they do in England and Scotland, so that the local debt altogether, we may assume, does not greatly exceed 300 millions. Adding this to the Imperial debt, we have a total indebtedness of between 900 and 1000 millions upon Government account. Economically speaking, I do not believe this sum to be a very important factor in the life of the community. Compared with the total capital of the country it is perhaps about a fifteenth or sixteenth, the proportion being one which will be examined

later on. The interest annually payable, allowing for the small rate at which the Government and local authorities can now borrow, is probably not more than about 30 millions, which is even a smaller proportion of the aggregate income of the members of the community than the capital amount is of the aggregate capital of the community. As we have seen also, the point has always to be considered with reference to such debts, that as far as the community as a whole is concerned they do not really count. Both capital and interest are transfers from A to B, and the quantity of the things which the community possesses as a whole is not affected by any changes that may occur in individual ownership. Of course there are other points of great interest in connection with debts owing by the State or by local authorities, and it is not a matter of indifference whether these debts increase or not, even when they are all held at home; but the degree of their importance economically is also a thing to be considered, and the debts must not be spoken of in the same way as it would be proper to speak of them if they were held abroad, and if also they were of large amount in proportion to the total resources of the communities concerned.

Another point of view from which the figures may be examined is that of the growth of the income and expenditure themselves, and of the principal branches thereof. One of the main uses to which such figures can be put is, in fact, to make them tell the history and show to the public in what directions there is progress or retrogression. It would be quite impos-

sible, however, in a work like the present to do more than indicate this possibility, the details respecting which comparisons could be made being simply innumerable. Those who make the comparisons should, however, keep two things in mind: the first is the importance in such comparisons over long periods of reducing all the items, whether of income or of expenditure, to so much per head. The amounts are continually changing in consequence of the growth of the community, and for many purposes of comparison the amount per head is consequently indispensable. The other point to keep in mind is the possibility of change in consequence of a change in the value of the standard money in which the amounts are expressed. It is no doubt extremely difficult to allow for changes in the purchasing power of money at different times, because these changes appear to be far from uniform in all directions, but in some way or other such changes have frequently to be allowed for when comparisons extending over different periods have to be made.

Without going into the history of the national finances generally, what appears to me on a general survey one of the most important facts is the great development of the expenditure on civil government within the last half-century. If we look at the financial figures of the Government at any date prior to that period, we find that the main items of Imperial expenditure have been either for debt interest or for Army and Navy, the expenditure on what would be called civil government proper

being comparatively small. At the same time the development of local government throughout the country was very restricted, and down to the middle of the century the expenditure of local authorities, apart from the expenditure upon relief of the poor, did not exceed a few millions sterling. The local Budget, in fact, down to about that date was a very small affair. Now we see that the expenditure on civil government by the Imperial Government itself has grown to 23 millions, while that of the local authorities is about 87 millions. I believe, as already hinted, that all this development of expenditure implies great progress in civilisation, and at any rate it is undoubtedly one of the most conspicuous results which present themselves when we look into the history of finance in this country.

I pass on to give a few illustrations borrowed from the experience of foreign countries, in order to give an idea of how such calculations work out in other cases. In France we find that the total income of the State and of the local authorities together, excluding Algeria, may be stated approximately as follows, the data being given for the latest available year in each case:

	Millions sterling.
State	137
Departments	11
Communes	30
Paris	12
Total	190

This total is not far short of the aggregate of the United Kingdom, but is made up somewhat

differently, the proportion received by the Imperial Government being a good deal larger, and the proportion received by the local authorities a good deal smaller than the corresponding figures in the United Kingdom. The total compares with an aggregate income of the French nation estimated by a great French authority, Monsieur Leroy-Beaulieu, at about 1000 millions, the proportion being thus 19 per cent, which compares with the proportion of about 12 per cent in the United Kingdom. It has to be considered, however, that in France the amount applied in the service of the debt by the Imperial Government alone is 48 millions, while considerable sums are also applied by the local authorities in the same way. Altogether the real expenditure by the different authorities, which is not in the nature of a transfer from A to B, as above explained, is probably somewhat under 130 millions, which would give a proportion of 13 per cent to the aggregate income of the country. No doubt the magnitude of the French debt is a serious factor in the problems of finance in that country. But the fact that so much of the expenditure of the Government is in the nature of a transfer from A to B, somewhat mitigates the impression as to the serious state of French finance which would be given by merely looking at the total figures and comparing them with the aggregate income of the people. It is also to be considered in making comparisons with other countries that the income includes not merely the income from the Post Office, such as we have,

but it includes the gross receipts of the tobacco and match monopolies, which are thus to some extent receipts from the conduct of a business and not receipts in the nature of taxation. With regard to taxation itself, the proportions received by the Government from what are called direct and indirect taxes appear to be not widely different from the proportions received in the United Kingdom, the direct taxes so-called yielding about 20 millions and the indirect about 80 millions. The direct taxes in France, however, are more various than the direct taxes in the United Kingdom, while the so-called indirect taxes again appear to include the income-tax so-called, which is of a special kind and yields much less than in the United Kingdom, stamps and duties upon estates passing at death, some of which would be classed by authorities in this country as direct taxes. With regard to expenditure, apart from the public debt, which has already been referred to, there appears to be a sum of altogether 37 millions for Army and Navy, which is not far short of the corresponding sum for the United Kingdom, the proportion for the Army being, however, larger, and the proportion for the Navy less than with us. The expense of Army and Navy together in proportion to the aggregate income of the community comes to about 4 per cent, as compared with the proportion of $2\frac{1}{2}$ per cent which we found to exist in this country. Even in France it is obvious the higher proportion does not suggest that wastefulness of expenditure upon armaments about which we

frequently hear so much. The fact of waste, as I have already pointed out in our own case, may be admitted, but the question is one of degree, and even as regards France I should hesitate to join in the conclusion that the economic waste involved in the armaments is of a kind ruinous to the community.

For Germany it is difficult to give the corresponding figures, because the Central Government in Germany is the government of a Confederation, and each member of the Confederation has a central government of its own, whose expenditure may properly be classed as Imperial in comparison with that of other countries. We find also that in Germany, owing to the extent to which the railways are the property of the governments, the accounts are all swollen, and properly so, by the inclusion on the one side of the gross income of the railways, and on the other side of the expenditure of the same railways. Making the best we can of the figures, however, we find that the total expenditure by the Government of the Confederation amounts to about 73 millions sterling, which includes 36 millions or thereabouts for the Army and the Navy in the year ending March 31, 1898. The principal income of the Confederation, apart from the contributions by the different members of it to the Central Government, appears to be from customs and excise duties, which yield about 36½ millions. The expenditure for the Army and Navy, it will be noticed, is practically the same as in France and less than it is in the case of the United Kingdom; allowing for a smaller aggregate income

in Germany as compared with the United Kingdom, the expenditure would still show a smaller proportion to income. Without going into the question of the income and expenditure of the different States of the Confederation, it may be sufficient to point out that for Prussia alone the revenue and expenditure are each about 110 millions sterling, one-half of which is accounted for as far as receipts are concerned by the railway administration alone, while the chief item on the expenditure side, or one of the chief items, is the contribution to the funds of the Confederation already referred to. The net income from the railways to the Government appears to be about 25 millions, as compared with a gross income of 55 millions. It is plain from such figures how very different the account of State finance in Germany must be from what it is in either the United Kingdom or in France, and how difficult it would be to arrive at almost any figures for comparative purposes. It will be a further complication in the matter to deal with the question of local receipts and expenditure, which must, however, be much less in proportion than they are in the United Kingdom.

In Russia it appears that the aggregate income of the State, as in the case of Germany or Prussia, also includes income from railways. The aggregate income was in 1897 slightly over 140 millions, mainly derived from the indirect taxes and from the income of State property, such as railways, which contributed 28 millions to the total in 1897, and the income from which is rapidly growing. The expenditure includes

about 38 millions for Army and Navy. It is difficult to arrive at any exact idea of the income of the people of Russia with which these figures could be compared, but apparently the amount of that total income is very much less than it is in the case of any of the nations with which we have hitherto been dealing; and, of course, it follows that as the population of Russia is enormous, the income per head must be very much smaller and the taxable surplus accordingly smaller still. A proportion of 38 millions for Army and Navy in Russia is therefore much heavier in reality than the similar proportion for the nations of the West. The expenditure in Russia further includes large items for the interest upon the debt and upon railway obligations, and for other interest paid through the Ministry of Finance. In this case it should be noticed the debt interest is a more serious matter than in any of the cases we have been considering, because it is the case of a burden which is external to the community, and it is no case of a transfer from A to B. *Per contra*, it has to be considered that for many years the debt interest has not really been paid by the Russian community to its foreign creditors. The amount has been set off almost invariably each year by a loan raised abroad, so that economically the people of Russia have not been affected by the payment of the debt, which remains purely an affair of the credit of the State. What the position of Russia, however, would be if the debt should come for payment, hardly requires statement.

One other foreign country may be mentioned—

the United States. Here the figures resemble to some extent those for the United Kingdom and for France, with noticeable and interesting variations. The aggregate totals are much the same, the revenue and expenditure of the Central Government and of the State and local authorities all put together being some 185 millions sterling or rather more, and about half belonging to the Central Government and half belonging to the State and local authorities. The expenditure, however, especially that of the Central Government, is very different. The amount spent by the Central Government for military and naval establishments in the year 1897, before the late war with Spain, was about 17½ millions, as compared with something like 40 millions in the United Kingdom and in France. Of course, as the United States has a population of some 70,000,000, quite comparable in economic force with that of either England or France, not to speak of its being superior, it becomes obvious that a charge of 17½ millions in the United States is very much smaller in proportion than the larger charge upon the United Kingdom or upon France. In fact, the charge may be considered a mere bagatelle. Interest on the debt, about 7½ millions, is also quite insignificant in the United States. *Per contra*, there is a charge for pensions amounting to the large figure of 29 millions, which is quite without example in the finance of older countries, and compensates to some extent the freedom of the United States from military and debt charges. The postal service, costing about 20

millions, with a revenue of only about 17 millions, is more expensive than that of the United Kingdom, even allowing for the difference of population, and there is a deficiency of revenue, not a surplus, as in the case of the United Kingdom. The expense of civil administration, about 22 millions Imperial and (in 1890) about 94 millions for State and local authorities, resembles very nearly in amount the expense for civil administration in the United Kingdom, although the objects are probably not quite the same. The expenditure in the United States, for instance, on education, is put down at 25 millions, against about half that amount spent by the Government in the United Kingdom, but it does not appear that the expenditure by towns and municipal authorities on sanitary drainage, police, and other purposes is quite so large in the United States as in the United Kingdom, although the population is so much larger. With regard to income again, the sources of revenue in the United States are different from those in the older countries. There appear to be no direct taxes in the revenue of the Central Government, the principal sources of income being about 37 millions from customs and 31 millions from excise, the remainder, exclusive of about 4 millions from miscellaneous sources, being entirely derived from the postal service. *Per contra*, however, the principal part of the local income of 94 millions is derived from a tax on property, real and personal, analogous to but not quite the same thing as the rates on real property which supply so large a part of the

revenue of local authorities in England. Generally the burden of government is much less in the United States than in the older countries of Europe, and probably this will continue to be the case, notwithstanding the changes which have been made quite lately in connection with the Spanish War.

Passing from these illustrations of foreign finance, we may notice two types of finance as exhibited within the British Empire which present great contrasts to each other, and which are otherwise extremely interesting. The first of these types is that of India, which, with a population approaching 300,000,000, has a revenue, according to the return for 1896–97, of 94 millions tens of rupees, equal at 1s. 4d. per rupee to about 62 millions sterling. As the statement is made by Indian official authorities that there is hardly a possibility of having more taxation in India, it is plain that a country with a population of 300,000,000, from which no more revenue than 62 millions can be raised, is very different from a population like that of the United Kingdom or France, amounting to about 40,000,000 only, from which a revenue of 200 millions, or thereabouts, is actually drawn, with a large surplus taxable capacity remaining, at least in the United Kingdom. At the same time, it appears from returns that the revenue and expenditure of local authorities in India is quite insignificant. It appears further that the chief item of revenue is that from "land," amounting to 24 millions tens of rupees, equal to about 16 millions sterling, which is spoken of usually as rent and not as taxation in the proper

sense of the word. Another large item of revenue is 20 millions tens of rupees, or about 13 millions sterling, from railways. In other words, half the total revenue of India is not taxation in the proper sense of the word, and further deductions would have to be made. The effect then, is, that the people of India, numerous as they are, are hardly able to bear taxation at all. Looking at the expenditure side of the account, we find that the three main items are the expense of civil government, including Post Office and charges of collection, 35 millions tens of rupees, or about 23 millions sterling; charges of railway revenue, 23 millions tens of rupees, or about 15 millions; and charge for the army, 24 millions tens of rupees, or 16 millions sterling. The expense of civil government is thus quite insignificant, compared with the similar expenditure in an advanced country like the United Kingdom or the United States. The most interesting item is that of the expenditure for the Army, which appears out of all proportion to the resources of the Indian people, although it may be justified as required for maintaining that internal order which is necessary to the existence of the community. However that may be, all the items, both of revenue and expenditure, clearly manifest the economic weakness of the great dependency of India.

The other type which I shall notice is that of Australia and New Zealand, which, with a population of 4,000,000 only, have an actual revenue of 30 millions sterling, or nearly half that of India, with its population of 300,000,000. No doubt this revenue of the Austra-

lian colonies is of an extreme type. It amounts to about £7 per head, and at the same rate the revenue of the United Kingdom would be 280 millions, or 40 per cent more than what it actually is, and the revenue of the United States would be nearly 500 millions! The causes for the existence of so peculiar a type of finance as that of the colonies of Australasia would bear examination, but one reason, no doubt, is the magnitude of the natural resources which these populations have to draw upon, and the amount of the expenditure which is incurred, not so much for actual government as for the making of roads, railways, and other works by which the resources are to be developed. Still, the phenomenon of communities which have so much revenue to give to the Government is in every way remarkable. The revenue from customs alone, it may be mentioned, is close upon 8 millions or £2 per head, and the corresponding revenue in the United Kingdom would be nearly 80 millions, and in the United States about 140 millions, against actual figures in those countries of about 20 millions and 40 millions respectively.

It will be understood that these references to foreign finance and certain financial types existing within the British Empire are merely intended to give some notion of the subject-matter of government finance itself, and of the kind of information which may be obtained from the statistics. They are in no way intended to be a summary of national finance, which it would be quite impossible to give within the limits of a volume like the present, and which would

in fact require a treatise by itself. What must be noticed for the present purpose is that the treatment of finance in the way suggested is specially dependent upon the statistics, and that there is the most intimate connection between statistics and finance.

The questions and controversies arising out of statistics of finance which we have finally to consider are extremely numerous. It is only possible to refer to a few of the more important.

1. The statistics can be used, and are, in fact, very often used in order to throw light on the changes in the course of business and on the well-being of the country. The income of the Government being dependent on the prosperity of the individuals forming the community, anything that affects the prosperity of that community must be reflected in the Government's income. The proposition is so simple and obvious that it may be accepted without question. Accordingly the figures of national finance are continually being referred to in discussions as to changes in the material growth of a country. It is necessary to observe, however, that the figures cannot be so used without great precaution and understanding of how the taxes are levied. For instance, a considerable part of the income-tax in this country is levied not upon the actual income of the year when the tax is paid, but upon the average income of several preceding years. The consequence is that the income-tax does not reflect at once quite completely any improvement or retrogression in the prosperity of the country. Similarly the death duties are not a particularly good

indication when year is compared with year, because the amount payable is liable to be affected so much by an unusual number of deaths among rich persons. These and the like points should always be kept in mind by those who wish to use statistics of finance as indications of the prosperity of the country.

With regard to revenue from taxes on consumption, it is also to be considered that articles consumed by the masses of the people are affected in different ways by changes in their prosperity, a good deal depending upon the question whether at a given date the consumption per head of a particular commodity is nearly at a maximum point or not. Thus there must always be a consideration of what the possible amount of improvement can be before inferences can be drawn. In some cases also the nature of the consumption has to be studied, a point of which a good illustration is furnished by the statistics of the consumption of sugar. A regular progression has been shown for many years in the consumption of sugar in the United Kingdom per head, and very large figures of late years have been reached, these figures being specially large when comparison is made with foreign countries. On analysis, however, it is found that the consumption to some extent is not properly to be compared with the consumption in foreign countries, as bearing on the question of well-being, because sugar is used in this country to a much larger extent than in any foreign country as the raw material of a manufacture, so that our figures of consumption include the use of sugar as a raw material for manufacture, although

the products of the manufacture may be exported. In some way or other, then, a distinction has to be made in such comparisons so as to show the final consumption by the different communities.

2. Consumption rather follows than accompanies a period of prosperity. One of the uses to which statistics can obviously be put is that of a comparison between different periods in the history of one country or between two or more countries. The difficulties, of course, are the number and complexity of the factors to be handled; the necessity for distinguishing, for instance, between actual and potential revenue; the fact whether debt interest has to be paid abroad or not; and the differences between different financial régimes which affect the comparison of the actual yields of revenue.

3. A purpose for which the figures are frequently used is that of the comparison of different financial administrations. One minister and one party seek to show that when they had charge of the finances of the country the management was excellent, and that when ministers of an opposite party had charge the results were not so satisfactory. I do not think it is necessary to do more than refer to the existence of such controversies, which are not, as a rule, marked by any fairness on either side. It is not to be expected that the arguments of partisans would deal with the subject in a calm and rational manner, so as to allow for all the different causes in operation and bring out a really fair comparison between one financial administration and another. I am sorry to say that the

presentation of the facts of this country's finance in the official books and in Budget speeches has been on the whole injured to an extreme degree by the effort of partisans for electioneering purposes. As we have seen, the good plan of showing the amount of the gross income and expenditure as the first figures in all the accounts, has been departed from, and an attempt, which is entirely unjustified, is made to distinguish between taxation properly so-called and other sources of income alleged not to be taxation. Still, there is no doubt that the statistics could be so handled as to be of real use in comparing historically one adminstration with another.

4. Another subject which the statistics of finance are frequently taken to explain, is that of the cost of carrying on wars. Here the appeal must be to the figures, and the appeal is constantly being made. I am not sure, however, that the teaching, as a rule, upon this head is altogether sound. There is a great disposition to exaggerate, as we have seen to be the case with reference to the armaments of nations in time of peace. There is also an impression that the expenditure on war is a waste of capital, which leaves the nations concerned exhausted and prostrate at the end of it to an untold degree. No account of the cost of war, however, is correct which does not allow first of all for the normal expenditure on armaments in time of peace, so as to show what difference is made to a community by the engagement in war itself. There is a limit, also, to what nations can possibly spend on war while it is actually going on.

By the necessity of the case the greater portion of a community, even in time of war, are engaged in quite peaceful pursuits. They must be clothed and fed and sheltered in time of war as in time of peace, and these avocations limit, of themselves, the force which can be put in the field, and the expenditure by the rest of the community in maintaining that force. As regards the waste of capital again, it has to be considered that the greater part of the expenditure on every war is not the expenditure of capital but the expenditure of income. It is the crops taken from the land, for instance, which are expended in a campaign, and not the land itself, which remains as capable as before of further production. Much suffering is inflicted on a community while war lasts, but it is not necessarily wasting its capital to any material extent, although the accumulation of capital may be altogether, or very nearly altogether, suspended. In an essay which I wrote long ago on the cost of the Franco-German war, immediately, in fact, after that war was over, I called attention to various points of this kind, and I may refer to this essay here.[1]

5. The effect of the imposition or modification of particular taxes has also to be studied by means of statistics. When a new tax is imposed a comparison, of course, has to be made between the actual results and the results that were anticipated. When a tax is reduced a comparison has to be made between the results anticipated, especially as regards recovery from the loss at first sustained by the modification

[1] See *Essays in Finance, First Series.*

of the tax, and the actual results. The effect of a general lightening of the rates of taxes has to be studied in the same way. It does not follow, because rates are reduced one-fourth or one-half, that there will be a corresponding reduction of the income of the Government, especially as, when heavy taxes are reduced, experience seems to show that a very considerable recovery will take place, and much more when the reduction is general than when it is merely applied to one particular tax.

6. Discussions of a very interesting kind also take place as to the amount of taxation levied upon particular classes of the community, either per head or in proportion to their means. The great difficulty in all these discussions is very often that of determining what the real incidence of taxation is. So long as the question remains unsettled, for instance, what is the real incidence of a rate upon real property, the most conflicting views must prevail as to the comparative burden of taxation in a community like that of England. The owners of the property and the occupiers both maintain that the burden is upon them, and as these taxes, as we have seen, constitute a large part of the income of the local authorities in the country, there is perhaps no possibility of beginning any real discussion by statistics as to the relative burden of taxation upon different classes. There are obvious difficulties again, with reference to stamp duties, with reference to death duties, and with reference to such sources of income as post office and telegraphs. Even in customs and excise, as we

have seen, there are difficulties as to what the ultimate incidence of the taxes may be, especially at particular periods when changes are made. All that can be done in view of these various difficulties is for those who attempt statistical comparisons to define clearly to themselves how far their knowledge extends, and to carry a particular comparison no further than the facts appear to justify. There is another difficulty which has frequently occurred to me. In a perfectly homogeneous community, where the taxes are of long standing, there is great probability of the whole burden having been adjusted by perpetual friction so as to bear equally upon every member of the community, or at least with approximate equality. The taxes which fall at first upon profits come in time to fall upon nobody in particular, the whole amount raised being distributed over the community and each person earning his profit subject to the aggregate charge which falls upon all alike. Similarly, as regards taxes on consumption, an adjustment is probably made by the adjustment of incomes and wages to the burden, more being paid to those members of the community on whom the taxes may fall in the first instance, and less paid to other members who escape. What is called the repercussion of taxation has, in fact, an equalising tendency of great force, and the effect may be, in an old country, where no changes of taxation have been made for many years, to render needless all discussion and question as to what taxes fall upon particular members of the community. This observation applies,

however, only to communities which are homogeneous, and would not apply to the relative incidence of taxation upon different communities.

7. This brings me to a particular controversy which has excited a great deal of interest of recent years, viz., the controversy as to the financial relations between Ireland and Great Britain. It was suggested many years ago by representatives of Ireland in Parliament and elsewhere that Ireland was unfairly taxed in comparison with other parts of the United Kingdom, more money being taken out of the people of Ireland for the purpose of government, in proportion to their resources, than was taken from the people of Great Britain. The subject was raised as long ago as 1865, when a Committee of the House of Commons investigated it, and I believe I may say that some remarks of mine in an essay published in the *Nineteenth Century* in 1886 had some influence in reviving the controversy. At length, in 1894, after various suggestions for a Parliamentary inquiry, which came to nothing, a Royal Commission was appointed to investigate the subject, and took a great deal of evidence, the conclusion arrived at being that Ireland was unfairly taxed to the extent of about 2 millions sterling per annum.

The controversy has become a huge one politically, but it would be a mistake to exaggerate its relative importance in economic literature. The issue, though it has become obscured like many other party controversies, is in reality simple, and is a purely statistical question. Do the people of Ireland as a whole and

on the average contribute more to the purposes of the State in proportion to their means than is contributed by the people of Great Britain? If it is known at all what the contributions by the two communities are, then there are facts which form the basis for a comparison with the taxable resources of the same communities. Irrespective of all questions as to whether the rates of the different taxes in the two communities are the same or not, the statistical evidence one would think ought to be decisive of the question as to whether one community contributes more than the other in proportion to its resources. It would be needless to go through all the evidence, but it may be sufficient to note that the Royal Commission accepted as indubitable (what is indeed the evidence of the officers of the Treasury) the statements which were made as to Ireland contributing about an eleventh or some such part of the total revenue of the United Kingdom. This being the case, the only question remaining for them to inquire into was the resources of the two communities, Ireland on the one side and Great Britain on the other. Here also, I think, the Commission must be held to be right in their conclusion that Ireland, while contributing about an eleventh part or some such proportion of the revenue, could not be supposed on any reasonable consideration to have more than one twenty-second or some such proportion of the resources. All the statistics as to production, as to accumulation, as to the yield of a direct tax like the income-tax, as to the amount of coal used, as to the

rate of wages paid, and many other particulars, were distinctly conclusive as to the inferiority of Ireland economically to Great Britain, whatever the exact figure that might be stated representing that inferiority. How there came to be a controversy at all on these simple points may thus be occasion for wonder.

One difficulty amongst people in Great Britain, as to accepting the conclusion, appears to have been quite honestly entertained, viz. the difficulty of believing that the imposition of the same rates of taxes in two countries would have inequality in taxation for the result. The Committee of 1865 broke down upon this point, and in all the discussions which have frequently taken place it is often found that the same difficulty is genuinely felt by many people of whose good faith there cannot be the smallest question. If I might make a remark, it would be that this difficulty is really the result of a deficiency among the public in mathematical reasoning. There is really no difficulty in the conception that like taxes may have different results in two communities. A tax upon coffee, for instance, would produce extremely different results in two communities, one of which consumes coffee largely and the other of which hardly consumes coffee at all. The thing is so obvious as hardly to require statement. Clearly then, there is no inherent improbability in the fact of the same taxes applied to Ireland and Great Britain extracting more in proportion from the means of the people in Ireland than they do from the people of Great Britain.

It has come to be generally admitted, in fact, in the course of the discussions, that the duty upon alcohol in Ireland is especially of a kind, looking to the habits of the people, that would take more from them in proportion to their means than it would on the average from the people of Great Britain, who are more largely consumers of beer than they are consumers of spirits. I am not going over the whole discussion here, however, and I can do no more than notice the fact that the difficulty has been genuinely felt, however unaccountable it may be to any one looking at the matter from the strictly scientific point of view.

Another difficulty that has been genuinely felt is with reference to the expenditure upon civil government in Ireland and Great Britain respectively. If, it is said, Ireland has contributed excessively in proportion to its resources, it has also received excessively in the shape of a large expenditure upon civil government, larger in proportion than any similar expenditure in Great Britain. This, however, raises a discussion of principle which need hardly be gone into in a treatise like the present. Is it the case that the average taxpayers of a community like Ireland, belonging to a United Kingdom in which they are entitled to equal treatment in the matter of taxation, can be compensated for unequal treatment by expenditure on civil government in Ireland itself? In evidence which I gave before the Royal Commission, which sat to consider the question, I gave reasons for answering this question to the effect that expenditure

on civil government in such a case is no compensation for unequal taxation. The opposite opinion, however, is very widely entertained in Great Britain, and I can do no more than notice the fact. It seems to me, I must say, a little unaccountable, for the simple reason that while the taxation is general, the expenditure may or may not be for the benefit of the whole community to which the taxpayers belong. It may, in fact, be for the benefit of a small number of members of that community only, and if that is the case the expenditure on a few individuals of the unequal taxation received from a great many individuals can obviously be no compensation to the many. In any case, as I have always maintained, the one consideration in reference to expenditure out of a common purse like that of the United Kingdom ought to be the general benefit of the whole people of the United Kingdom, and the argument that an excessive amount is spent in Ireland is an argument that the money of all the taxpayers is being improperly expended.

This brief notice of a discussion which has been most voluminous is all that I can spare for the present work, but those who are interested in the statistics of taxation and the kind of problems which they may be used for settling, can be referred to the proceedings of the Committee of 1865, already referred to, and the proceedings of the Royal Commission which sat more recently, as well as to numerous Parliamentary returns showing the taxation of Ireland and Great Britain in different ways and the amount of the expenditure upon civil government. I would

only add one remark, viz., that if the communities of Ireland and Great Britain had been quite homogeneous, and had not been, economically speaking, heterogeneous, the discussion, I should have considered, was altogether out of place, because we should have been bound to assume that the taxes, being long established, had equalised themselves.

CHAPTER XII

MONEY MARKET STATISTICS

As a preliminary to giving some account of the statistics of the money market and of currency and banking, it may be convenient to give a short description of the money market itself. The nature of the statistics and how they are to be used depends on the comprehension of the business to which they relate, and the business is of so complicated and all-pervading a nature in relation to business generally as to require close study to understand it.

To a certain extent the work is already done to our hand. Mr. Bagehot's famous *Lombard Street* is a description of the money market, and this description, as regards the most essential part of the subject, is as complete as it is interesting. "The objects which you see in Lombard Street," says Mr. Bagehot, "are the Bank of England, the private banks, the joint-stock banks, and the discount houses." And he proceeds to give an account of the nature and functions of these chief constituents of the money market of England, which is also the central money market of the world. For the convenience of handling

the statistics, however, it seems expedient to enumerate other constituents of the market and describe their functions, as well as to give a more formal account of the business.

In a certain sense, then, the money market in a given community does not consist merely of the chief banks, viz., in England the bodies above enumerated, but it must comprise the aggregate of persons buying and selling, *i.e.* buying with and selling for money, because money is a necessary element in every purchase and sale. It is not usual to look upon the dealings in money in this manner; that is, from the point of view of its being a commodity like any other commodity; but this characteristic of money always remains in the background, and some of the statistics connected with the money market, as we shall see, involve the treatment of money from the point of view of its being a commodity.

It would be a forced use of language, however, to speak of the money market as being the market for money in this widest sense, which would, in fact, make it the sole market, since everything is bought and sold for money. A narrower sense in which it may be used, which does not depart so widely from the ordinary usage of the word, is that the money market is the aggregate of persons investing, lending, or borrowing money or moneyed capital. Even this, however, would include every member of a given community in his capacity as an investor, a lender, or a borrower, and is again too wide a description as the word is ordinarily used. A description corresponding

with actual ordinary usage would, however, be that the money market consists not merely of such constituents as are named by Mr. Bagehot, but also of the aggregate of persons investing, lending, or borrowing money who are placed around, and associated with, the Government and the chief banks in a country, which means, in England, mainly the institutions that Mr. Bagehot refers to as the Bank of England, the private and joint-stock banks, and the discount houses. What I wish to draw attention to in noticing the possibility of a wider description is that the narrower description is applied to an organisation with no definite boundaries, and that there is, in fact, a large body of persons not so immediately connected with the centre, who nevertheless constitute from time to time an essential part of the whole.

There ought to be added also, I think, to the constituents enumerated by Mr. Bagehot, various other constituents which are essential to the complete working of the organisation called the money market. Amongst these the Government itself ought to be specifically mentioned. The Government is one of the largest depositors in the Bank of England, and one of the most important customers of that institution and of the banking system generally throughout the country. Its business, not merely in collecting and spending the revenue, but in carrying on such a business as the post office, is immense, so that its turnover is most important to the banking community. It is also a large banker on its own account in the savings bank business. I think also there should be

enumerated along with the private and joint-stock banks and discount houses, the agencies in London of banks all over the world, which are not expressly included among the private and joint-stock banks which Mr. Bagehot had in his mind. The existence of such agencies and banks constitutes a distinct feature in the money market of London. Besides these there ought to be included, I believe, the Stock Exchange and other organised markets, like the Grain Market of Mark Lane, the Liverpool Cotton Market and the markets connected with the Produce Clearing House Association. The Stock Exchange is the market for securities, and one of the chief parts of the business of bankers is to lend to the leading members of the Stock Exchange for short terms on securities. The other organised markets also provide employment for banking funds in a similar manner. Banking, as conducted in London, requires the use of all these agencies. We should also include an association like that of Lloyds for purposes of marine insurance, the association on the one hand providing the money market with a portion of its deposits, and on the other hand rendering bills of lading available as banking security in a way that would not otherwise be possible. All these associations are intimately connected with the money market itself, and the business could not, in fact, go on without them. There are also groups of firms engaged in the business of accepting and negotiating bills drawn on them from abroad, or engaged in the business of exchange; and firms of brokers and dealers in bullion,

including the refiners who form a small and essential part of the whole market. Last of all I would enumerate the individuals and companies of different kinds, merchants and manufacturers, who employ their funds at times directly in the loan market, just as the private and joint-stock banks themselves give employment to the discount houses. The money market, as we know it in Lombard Street, requires all these agencies and institutions, each of which plays a distinct part. The money market of London is, in fact, what is called a short loan market, and without institutions such as have been described, especially without the Stock Exchange for dealing in securities, and the organised markets for dealing in other commodities, the business of the short loan market could hardly proceed at all.

The general nature of the business is that the banks on one side receive deposits from customers against which, on the other side, they hold either cash or securities. One bank may deposit with another bank, and call that deposit cash, which it is to all intents and purposes, but ultimately the deposits must all be represented by actual cash or securities somewhere. It does not matter in this view whether the deposits are for long terms or on current account, against which the depositor may operate at any moment. The point is that the deposits themselves in a solvent system must be represented by actual cash or by securities. It must not be supposed also that the deposits always come first in point of time. A loan by a banker nowadays usually takes the

form of a sum placed by the banker to the credit of his customer, so that, in fact, the advance of the banker has preceded the deposit, and the two things are reciprocal. Against the deposit of the customer the banker has the security of the customer's liability to repay the advance. Of course, when the customer draws against the deposit, the banker has to find the cash, and if his cash is thereby diminished he has a larger amount of securities and a smaller amount of cash. Usually, however, in the banking system the cash which is drawn away by one customer comes back to the account of another customer, so that the effect of increasing advances by banks is not so much, at first at any rate, to diminish the cash as to increase the general liabilities of the bankers as a whole, and to diminish the proportion of the cash to those liabilities. Both sides of the bank's ledger are diminished when individual owners actually invest for themselves, whether in the purchase of securities or by lending money directly to borrowers. The deposits are thereby diminished and the securities are likewise diminished. The business, however, is indefinitely elastic, and the securities and loans can be reconverted quickly into deposits in the banks by means of borrowing operations. Although, therefore, the amount of deposits and of securities may always be fluctuating, they are reciprocal to each other, and the liabilities of those concerned in the market as bankers are to be measured in part, not by the actual amount, but by the possibility of their being rapidly increased at any

moment when, from speculative motive or panic or other causes, individuals are more disposed to borrow than at other times.

The general object, then, of statistics of the money market is to give information to those interested in various degrees as to what is happening in this immense business. The leading banks themselves, and those more directly associated with them, such as the leading members of the Stock Exchange and the members of accepting and exchange houses, are of course keenly interested in almost all the points, but there is also a diffused interest throughout the whole mercantile community and throughout society generally, one cause of general interest being the interest which people have as investors. The main points as to which information is, in fact, given appear to be these:

First.—The rates for the loan of money itself, these being as various as the different terms for which loans can be made and the different securities upon which money is lent. The things of most general interest to the market, however, are the rates upon deposits given by the banks and discount houses on the one side, and the rates for day to day and quite short loans on the other side, these loans being based upon English Government securities or the equivalent. Next to these come the rates for the discount of bills at two or three months, or four months, or six months, as the case may be. The lending, it should be understood, is out of what is practically one fund in the aggregate, which is

possessed and lent now by one person, now by another, and borrowed now by one person, now by another, but the aggregate borrowing and lending remaining much the same; while if there is any increase or diminution in the aggregate at all, it arises, as above described, from a change in the disposition of the ultimate owner of the fund or investor on the one side, and of the ultimate borrower on the other side. The disposition of the fund varies, however, a larger sum being lent for short periods at one time than another, although it is probable that the proportion between long and short loans does not vary in the aggregate beyond a narrow percentage. A clear understanding of the difference that may exist between the rates for long and short money is one of the points aimed at in giving the statistics.

Second.—Information is required as to the amount of the deposits in the central bank or banks, the amount of Government deposits, and the amount of securities held, and especially as to the amount of cash held as reserve. This last is the main theme of Mr. Bagehot's *Lombard Street.* The reasons why reserves are necessary and the causes which regulate the amount held are there set out. Statistics become necessary in order to show to all concerned when practical action may be necessary to protect or increase the reserve, which is thus one of the essential factors in guiding the market as to what the rates for loans should be.

Third.—Other statistics relate to the amount of bank-note circulation, the amount of coinage in

circulation, and the turnover in what are known as the bankers' clearing-house returns. The latter, however, have become far the most important in an organised system like the money market of London. The paper issues of our banking system, which really represent what we may call "innominate" deposits, are now quite insignificant compared with the aggregate of other deposits. The same remark applies to the coinage actually in circulation. The statistics which are of use in these cases relate to the variations in the circulation and to the flow of coinage into and out of the central banks rather than to the total amounts of these things themselves. It is the returns of the bankers' clearing-house, however, which now show more than anything else the activity of business. Payments are now universally made by cheques, and it is the balancing of these at the end of every day at the bankers' clearing-house which shows diminution or increase in the activity of business. In this connection what are called the movements of bullion have also to be studied, because it is the movement of bullion into or out of the central banks which indicates an increase or diminution of the reserves held. The whole movement of bullion from the production at the mines until the final distribution, and the movements to and fro between different countries according to changes in the rates for money, have therefore to be studied in connection with the money market.

Fourth.—It may be added that, apart from the special statistics of the money market, the prices of

securities and of commodities, which are of general interest for other reasons, have to be specially studied by those connected with the money market; and the prices of some securities are of special interest in this connection. The statistics of production and trade generally must also be followed by those connected with the money market, for obvious reasons. In particular, bankers have a special interest in following the statistics of accumulation and of investment, which are dependent on the changes in the prosperity of trade.

It need hardly be added that these statistics are not collected and used for a particular country only, but it is necessary for those concerned to take a very wide survey. The money market of New York or of Berlin is thus almost as interesting to the banker in Lombard Street as the money market of Lombard Street itself. The whole world of business must indeed come under review in a proper study of the money market, and statistics be drawn from a most extended area. We may also add that a special subject for statistics in this department must necessarily be the profits of the various banking institutions, and institutions of a like kind, when studied from the point of view of production.

The data for the statistics in this department are for the most part of spontaneous origin. They have been instituted from time to time by those connected with the money market on account of their obvious utility in the daily operations of the market. This applies most obviously to the rates for the loan of

money and to the prices of the leading securities and commodities as well as to the movements of bullion, in all of which those connected with the money market almost from time immemorial have taken the liveliest interest. Publications like Wetenhall's List are of very ancient origin, and during the last half-century there has been an immense development of financial newspapers giving much attention to statistics. The publication of information as to the leading items in banking accounts has been of more recent origin, the motive for the collection of such data in this country apparently having been the necessity for obtaining figures felt by different Committees and Commissions of Inquiry, appointed when some crisis or other had occurred in the money market. The information thus demanded for special purposes has gradually come to be issued regularly, the most important change of all being made in 1844, when the Bank of England was required to publish its account weekly in the present form. Now, however, all the great banks of the world, the Bank of France, the Bank of Germany, and the chief banks of other European countries, publish their accounts regularly, while in the United States the Treasury, which performs to some extent the functions of a banker, publishes a monthly account, and the New York and other central banks publish weekly accounts. The official publications, therefore, owe their origin distinctly to popular demands from time to time, which is the best evidence of their actually being required for daily business. The data, as far as they

go, are consequently, it may be considered, entirely trustworthy. They are, in fact, periodical records of facts which are capable of being clearly defined and stated, and which are published daily, weekly, monthly, and at other periods under the close supervision of a watchful class, who would be ready to detect the slightest variation from the fact and to expose it.

It would be foreign to our purpose to give a complete account of the money market and its working, as our business is merely with the statistics. It will, nevertheless, be found that in giving some account of the leading statistics in the order above mentioned, the money market itself is fairly described.

We begin with the statistics of the rates for money. The most conspicuous rate which is quoted is that of the minimum rate of discount at the Bank of England. This is the rate regularly notified by the bank, usually once a week, but occasionally at more frequent intervals, below which it will not lend or discount. The notifications are looked forward to with the utmost interest by all concerned with the money market, and occasionally in times of the least excitement with very great interest. The yearly averages for a long period past have been as follows :

[TABLE

BANK OF ENGLAND. ANNUAL AVERAGE MINIMUM RATE OF DISCOUNT.

1850	£2	10	1	1862	£2	10	7	1874	£3	13	10	1886	£3	1	0
1851	3	0	0	1863	4	8	2	1875	3	4	8	1887	3	7	0
1852	2	3	0	1864	7	8	0	1876	2	12	1	1888	3	5	11
1853	3	13	10	1865	4	15	4	1877	2	18	0	1889	3	10	11
1854	5	2	3	1866	6	19	0	1878	3	15	8	1890	4	10	5
1855	4	17	10	1867	2	10	9	1879	2	10	4	1891	3	5	2
1856	6	1	2	1868	2	1	11	1880	2	15	4	1892	2	10	7
1857	6	13	3	1869	3	4	2	1881	3	10	0	1893	3	1	0
1858	3	4	7	1870	3	2	0	1882	4	2	8	1894	2	2	3
1859	2	14	7	1871	2	17	8	1883	3	11	4	1895	2	0	0
1860	4	3	7	1872	4	2	0	1884	2	19	1	1896	2	9	8
1861	5	5	4	1873	4	15	10	1885	2	17	7	1897	2	12	8

It will be understood, of course, that the Bank of England rate is only one rate amongst many. Its importance is due to the fact that, as the holder of the ultimate reserve, what the Bank of England does necessarily influences the market as a whole. Dealers and every person concerned know that if for any reason during the continuance of their own operations they have to fall back upon the Bank of England, the minimum rate and more may have to be paid by them for the necessary advances to conduct their business. Consequently they are unwilling to carry on their own operations without some reference to what the Bank of England will be able to do for them. By custom, also, many operations are regulated by the Bank of England minimum rate. Bankers all over the country openly regulate the rates which they charge for money by what the Bank of England does, and it is a frequent custom amongst them in lending to their customers to make their charge vary with the Bank of

England rate, the condition usually being that they charge bank rate, or 1 per cent or 2 per cent above bank rate, according to what the arrangement with their customer may be. The Bank of England rate, however, is not a perfect indication of the course of the market in Lombard Street, where much lower rates are frequently charged for different kinds of money. When, for example, the bank rate is 3 per cent, the market rate for 3 to 6 months' fine trade bills may range from $2\frac{1}{2}$ to 3 per cent, for bank bills from $2\frac{1}{4}$ to $2\frac{1}{2}$ per cent.

It will be understood that these are the rates charged by the leading institutions grouped round the Bank of England, and belonging to the central market. They are not the rates charged by the different banks all over the country to their own customers, but usually special and lower rates depending upon the special fund accumulated from all sources in the money market of London and centralised there. Statistics have also been collected as to these rates, showing their variation from week to week and from period to period. But it seems unnecessary to give an account of them further, as, broadly speaking, the variations follow those of the Bank of England minimum rate itself.

These rates, it will be observed, do not include the various rates charged upon the Stock Exchange and in the other special markets above referred to, where short money is employed. The multiplicity of rates would make it impossible, with due regard to space, to give a full account of them here, but although they

are not further referred to, their importance in the daily business of the markets will be fully understood. What it may be useful to explain is that here again there are different sets of rates. What the banks charge for loans to leading members of the Stock Exchange upon securities is one thing; what is charged on the Stock Exchange itself to the miscellaneous customers of the Stock Exchange is another thing. The latter, as a rule, in Stock Exchange transactions, are charged in the form of what are called contangoes, the dealer who lends the money buying stock from the borrower on one account day for cash and selling to the borrower for settlement on the following account day at a higher price, the difference representing the charge made for the loan of the money involved in the interval. These contangoes apply to operations in which in fact no money actually passes, and they have come to be considered as entirely connected with gambling operations on the Stock Exchange. In their origin, however, these contangoes are in effect rates for the loan of money, and that characteristic actually applies to a considerable portion of the operations where contangoes are charged. The miscellaneous rates charged to the customers on the Stock Exchange are frequently very high indeed, and the intermediaries between the bankers and their customers accordingly make considerable profits on the difference between the rates they themselves pay to the bankers and the rates which they charge. The business, however, where high rates are charged, is of course speculative and risky.

The lending on Government securities on the Stock Exchange takes a similar form, and here the transactions are not merely speculative but often large and serious. A bank, for instance, desiring for any reason to obtain cash quickly, can do so if it pleases by transferring a portion of its Government securities at one price for cash and agreeing to receive them back on the following account day at a higher price, the difference being the rate charged for the loan of the money in the interval.

Not infrequently, it may be added, it has happened that, owing to the condition of speculation when operators on the Stock Exchange have largely sold securities of which they are not in possession, the rates for loans upon these securities have greatly diminished, and the operators have, in fact, been willing to pay for the loan of these securities. These rates are called backwardations, and are the opposite of contangoes, but they are essentially of the same nature, the contango being a rate for the loan of money, and the backwardation a rate for the loan of the security. Bankers, I am informed, are occasionally in a position to lend the securities which they hold to great advantage. By the arrangements of the Stock Exchange they receive cash for the securities, and the person to whom they lend securities engages to return them on the account day at a less price, the difference being the backwardation, of which the banker gets the advantage. Meanwhile the banker, of course, has the use of the money which he has received for the securities. These remarks are

designed merely to illustrate what the statistics of rates for money really mean.

Other rates which are frequently quoted are those offered by the different banks for deposits. Those offered by the banks generally to the public are usually based upon the Bank of England rate, so much being offered for deposits at call, or seven or fourteen days' notice. But in addition the discount houses specially offer rates for deposits in a more detailed form, the deposits which they attract, however, not being deposits by the public generally, but deposits by bankers themselves. Statistics of such rates are also prepared, and exhibit the history of the money market, like the statistics of the Bank of England rate itself, but beyond indicating how the figures are used it seems unnecessary to refer to them further in a work like the present.

Before passing from this question of the rates for money, it may be convenient to notice that there is the closest connection between these rates and the prices for investments. Money, as we have seen, is lent by bankers to the Stock Exchange and by members of the Stock Exchange to their customers, speculators and others, so that the price of the securities comes to depend upon the rates payable for the borrowed money with which they are held. As the rates which the lenders thus obtain diminish, there is a great tendency to keep money in hand and to invest it directly. On the other hand, as the rate obtainable for loans increases, there is a tendency among bankers and others to withdraw money from

investment, that is, to sell the securities and re-lend the very money they thus obtain in order to enable the borrowers to hold the same securities. The prices of securities accordingly, and specially of the best securities, tend to advance while money in the short loan market is abundant, and rates there are consequently low, and *vice versa*. Any great fall in securities also arising from panic or any other cause attracts money at once from the short loan market for investment, and so the fall is mitigated. In fact, when we look into the matter, it is found that the money which had been in the loan market and lent through it to borrowers on the Stock Exchange, by whom the falling securities have been held, is now applied by the holders of the money to the purchase of the securities themselves. It is very largely the same money which is used in both cases, only the form of use is changed.

It is believed that for a great many years past the rates for money have on the average been declining, but this is a point not so directly connected with the daily facts of the money market, where interest is taken mainly in the fluctuations from season to season or from period to period. Obviously, however, the statistics of the rates for money which arise in the money market are indispensable in settling a point of this kind, although the more important figures may be derived from the average experience of great lending and investment institutions, such as insurance companies, who can tell the average rates they have been enabled to obtain upon their funds from time to time.

The next statistics to be referred to are those of the deposits in banks and the bankers' reserves, principally the deposits and reserves of the Bank of England. What has been said, however, as to the elasticity of the English banking system, and the way in which deposits and loans may simultaneously increase, makes it evident that the chief point to which attention must here be given is that of the reserves themselves. The liabilities, in fact, constituted by the deposits owing to the system of the money market are liabilities of quite indefinite magnitude, because the deposits themselves may be increased indefinitely at any moment in consequence of the borrowing operations of the customers of the banks. It may be useful, however, to give a short note indicating the increase of what are called the private deposits in the Bank of England on the average for many years—not to show any exact proportions between these deposits and the reserves, but merely to indicate the enormous growth of business which must have taken place, and the enormous growth of the deposits in banks throughout the country which lies behind the growth of the deposits in the Bank of England itself. These figures are:

[TABLE

BANK OF ENGLAND. ANNUAL AVERAGE OF PRIVATE DEPOSITS. MILLIONS STERLING.

1850	9·8	1862	14·6	1874	18·8	1886	24·0
1851	9·4	1863	14·0	1875	21·2	1887	24·0
1852	12·8	1864	13·2	1876	23·5	1888	24·5
1853	13·5	1865	14·0	1877	22·6	1889	25·4
1854	11·0	1866	16·7	1878	23·2	1890	27·5
1855	11·7	1867	18·8	1879	30·6	1891	31·4
1856	11·2	1868	20·2	1880	26·1	1892	30·3
1857	10·7	1869	18·1	1881	25·2	1893	30·3
1858	14·1	1870	18·1	1882	23·6	1894	33·6
1859	14·4	1871	21·3	1883	23·6	1895	40·6
1860	13·5	1872	20·0	1884	24·0	1896	49·4
1861	12·5	1873	19·1	1885	26·6	1897	39·8

Similar figures can be given as to the deposits in the chief banks of the country, but they are all subject to the observation that they are not in any way exact amounts, but may be increased or diminished very largely at any moment, according to the disposition of investors and borrowers.

A fuller account may, however, be given of the reserve in the Bank of England. It will be gathered, from what has been already stated, that the most critical point of the statistics of the money market is that of the amount of the central banking reserve, whatever it may be.

When Mr. Bagehot wrote, in the early 'seventies, he spoke of the "apprehension minimum" of the Bank of England reserve at that time as being about 10 millions sterling. The difference between the ideas which then existed and those which now prevail, shows of itself the magnitude of the increase

in the business of the money market which has taken place in that short period. There is a prevalent feeling in many quarters that even the present minimum is much too low, and that it would be desirable for the Bank of England or some other agency to strengthen the reserve at the centre. The subject is one which has been much discussed among bankers and others, and which will probably continue to be discussed, as there is evidently a flagrant opposition between the amount of liabilities on demand in our banking system and the cash available to meet them, which does not look well. There is much reason, however, for believing that the system is much more solid than it looks. It presupposes a state of good credit, but that is a presupposition without which the banking system could not itself exist. And, given a state of good credit, there is really no reason why a comparatively small amount of cash held in reserve against emergency should not be sufficient. The purposes for which it is required, viz. to allay panic upon some excitement occurring to disturb credit, such as occurred at the time of the Baring collapse in 1890, are of a definite and limited kind. All the leading people connected with the money market, those whose claims upon the banks are largest, have also the utmost interest in maintaining the solidity and regularity of the system, and they are not likely to call for their deposits in a time of stress. In fact, they are much more likely then to increase their deposits than to diminish them. The great mass of depositors also have an extreme interest in the same direction;

very often their deposits are merely a set-off against advances which they have to repay to the bankers, and they are under the very greatest pressure not to withdraw them. In spite then of the apparent magnitude of their liabilities, bankers are able to look with *sang-froid* at their balance sheet, and to go on steadily with their business, in the security that on the approach of any time of stress or difficulty the bank reserve can be quickly increased to any amount that may be required.

Looking at foreign countries, we find that the provision of actual cash, as a rule, is on a much larger scale abroad than it is in England. In France it is found that the actual cash in the Bank of France, the cash available to meet liabilities, because there is no division in France as in England between the issue and the banking departments, exceeds 100 millions. There is in France, however, no such banking liability as there is in England. There is no hierarchy of joint stock and private banks receiving deposits, and no regularly organised money market, where the advances may be increased indefinitely on the one side and the deposits on the other side. There is a large amount of innominate deposits represented by the paper issues of the Bank of France, but no system of deposit with its indefinite liability, such as there is in England. In one sense, therefore, the Bank of France and the banking system in France may be considered enormously stronger than the system established in England. The cash reserve against the banking liabilities is, in fact, to all appearances

superfluously strong by comparison. The explanation, however, is not altogether favourable to France. The magnitude of the reserve, it may be considered, is in fact due in part to the danger of revolutionary changes, which no French bank could possibly leave out of sight. It appears also to be due in part to the mischief arising from the bi-metallic system of money which France at one time possessed. Nearly one-half of the reserve in the Bank of France consists of silver coins, the bullion contents of which at the market value of the bullion are worth less than one-half the nominal value given to the coins by the State, and at which they circulate. The real reserve of the Bank of France consists, therefore, of the gold held which has a market value corresponding to its face value; and the so-called reserve of silver coins is a superfluity because, in fact, they could not be received by those who have deposits with the Bank of France in payment of their liabilities, although the Bank of France would have a right so to pay them.

In Germany the reserve of the Imperial Bank is usually over 50 millions, again a much higher figure than the reserve in Lombard Street, although the banking liabilities of Germany, actual and potential, are much less than the banking liabilities of the English banking system. The motives for a larger reserve in Germany are, however, much the same as those in France, and the reserve is also swollen in appearance from much the same cause, viz., that the bank holds a considerable amount of silver coins belonging to a former system, which cannot be

got into circulation, and which are really superfluous for any purposes of reserve.

Turning to the United States again, the difficulty is to locate the reserve, the duty being divided in a way which it is not easy to describe between the Treasury and the leading banks. The Treasury holds an immense sum both in gold and silver against paper issues of different kinds, a sum, it may be remarked, of entirely superfluous magnitude. Against issues of about 200 millions sterling of paper of different kinds the State holds no less than 100 millions nominal value of silver coin and silver bullion, besides a sum of about 35 millions in gold coin and bullion, this latter, however, being of varying amount. There is not the smallest doubt that the gold reserve would be amply sufficient for all purposes of maintaining the value of the paper, and that the whole of the silver held is absolutely superfluous. I should regard, however, the cash in the Treasury in the United States as a special fund outside the banking system altogether. The real reserve of the country is the cash held by the New York banks, and amounts in ordinary times to 20 or 30 millions. This sum is held by the banks partly in actual gold coin and partly in the form of Government paper of different kinds, but in whatever way it is held, it is a reserve of cash held for banking purposes merely. The position then is that while this sum held by the New York banks is the usual banking reserve, the community in the United States have at their command, for cases of extreme emergency, the possibility of resorting to the cash held by

the Government, although that cash is not usually available for banking purposes. There is a great similarity in this view between the United States and England; the total banking reserve held is really much the same in both countries against liabilities probably not dissimilar in amount. And although the banking system is even more developed in England than in the United States, yet, the United States being much larger in population and in resources generally, it may be allowed that the banking liabilities altogether are not unlike those of England. The extra reserve which the United States appears to have in the form of the cash held by the Government is set off, unfortunately, to a very large extent by the insecurity inflicted on the whole system through the action of the Government in not keeping down the issues of paper, and allowing them at times to become redundant.

The first thing then in the statistics of the money market is to observe from time to time the amount of the banking reserve held in the above four countries, and chiefly in the Bank of England. The rule of thumb is a very simple one for practical purposes. At any time when the reserve falls to the apprehension figures which have been stated, those concerned with the money market must look out. Operations must be based upon the view which people take as to the circumstances favouring or not favouring the maintenance of what is considered to be the minimum reserve, and in unfavourable circumstances an increase of the rates for money must be looked for.

The next statistics to deal with are those relating to the amount of the bank-note circulation, the amount of coinage in circulation, and the turnover in what are known as the bankers' clearing-house returns.

With regard to the issues of paper representing what we have described as the innominate deposits, there are remarkable differences between different countries, revealing differences of habits, customs, and conditions of business of a remarkable kind. In England, where there is a large concentrated population and where the banking system is also highly developed, so that everybody can have a banker, the innominate deposits represented by issues of paper are comparatively small. The note circulation of the Bank of England itself is about 28 millions only, and the circulation of all the other banks in the United Kingdom is about 14 millions, making a total of 42 millions, or little more than £1 per head of the population. Even this sum is larger than the real amount of the circulation, because a large part of the issues of the Bank of England is held by other banks, and the real amount of the paper issues in the hands of the people is consequently much less than 42 millions. In the United States again, where there is a population nearly twice as great as that of the United Kingdom, and where the population is also spread over an immense territory, so that the same banking facilities as in England cannot everywhere be applied, the circulation, in other words the innominate deposits, is practically four to five times that of the United

Kingdom, which we have stated. The Government issues of paper, as we have seen, are about 200 millions, including the notes of the National Bank to the amount of about 45 millions, and even if we deduct from this sum the amount of Government paper held by the banks themselves, it would still be found, I think, that the circulation of paper in the United States is over £2 per head of the population, as compared with £1 per head or less in the United Kingdom. In France the peculiarities are even more remarkable. Here the population is much like that of the United Kingdom, and is also concentrated upon a comparatively small area, but the circulation of the Bank of France very nearly reaches the total of the circulation in the United States, amounting, according to the latest returns, to about 150 millions, or very nearly £4 per head of the population. It is evident then that the banking system must be much weaker in France than it is either in England or in the United States. At the same time the peculiarity of the note circulation in France appears to depend to some extent upon the unwillingness of the people to receive into circulation the silver coinage which has been referred to, and in which the Bank of France has power to pay them if they were to present the notes for payment. I can explain in no other way the enormous increase of the paper issues of the Bank of France since the time of the war in 1870–71, when the circulation amounted only to about 50 millions. In Germany the condition of the circulation appears to be not very unlike that

of England, the amount being very nearly the same in proportion to the population. Possibly the magnitude of the circulation in the United States may be explained in part by the issue of paper of small denominations, whereas both in England (with the exception of certain small issues in Scotland and Ireland) and Germany there is no issue for sums of less than £5, and in France there is no issue for sums of less than £4. Apart from this cause of difference, it is believed that both in France and in the United States there is naturally much larger room for paper circulation than there is either in Germany or the United Kingdom.

We may conclude from these statements as to the paper circulation in the principal countries of the world, and the conclusion would be confirmed by an examination of the facts in other countries, that there is no rule as to the amount and proportion of this circulation in any country. No rule *a priori* can be laid down, nor can a law be deciphered from actual experience. The conditions are altogether too various, and habit and custom, which accident may determine, play too great a part. While it is difficult, however, to make the amount and proportion per head of the paper circulation in a given country the subject of rule which can be definitely stated, there are certain elements in the facts as to the circulation which vary with a good deal of regularity, and these variations are studied with much practical utility by those concerned with the money market. These are what are called seasonal variations. Every month, it

may be said, there is an ebb and flow of the circulation; probably every week and even every day there is such an ebb and flow. These changes are of moderate amount, as a rule, but in addition in most countries there are one or two changes every year, sometimes of considerable importance. At the end of each quarter in England there is an increased issue of paper from the central banks; and this increased issue is greater at the end of March and at the end of September or beginning of October than at any other time. The whole subject is so fully discussed in Mr. Bagehot's *Lombard Street* that a reference to the fact here may be quite sufficient. Statistically, these variations are constantly followed by those concerned with the market, and the practical use of them is that as the variations can, to a large extent, be foreseen, a banker in estimating his reserve must not look merely at the actual amount of the circulation, but at the amount to which it may be increased in the ordinary course. An increase of the note circulation of a bank is formally an increase of liability only; but such an increase of liability affects, of course, the proportion of the reserve. In the English banking system also, owing to the conditions imposed by the banking legislation of 1844, especially the condition separating the issue from the banking department of the Bank of England, and requiring the deposit of actual cash in the issue department, independent of the banking reserve for every note issued, an increase of note circulation does mean an actual diminution of the legal banking reserve. Similarly, when the

paper issue is looked at during one of the periods when it is regularly larger than at others, the banker may look forward to its reduction in due course. To some extent the transactions of the market must be governed by the knowledge thus derived.

With regard to the coinage, it must be acknowledged that there are few more difficult subjects for statistics than the ascertainment of the amount of coinage in any one country or in different countries. The records of the Mint tell how much coin has been issued, but as it is known, especially with reference to a coinage like that of England, that a large portion of the issues is exported and remains abroad or is otherwise melted and consumed, it is not possible to deduce from these records of issues what the circulation is at any given time. To get over this difficulty various expedients have been tried, the most successful being that of Mr. Jevons in 1868, when he made an extensive counting of the proportion of coins of different issues in actual circulation in England, and then deduced from what was known as to the probable amount of some recent issue that was actually circulating, and from the ascertained proportion of that issue in circulation to the whole, how much the total in circulation of all issues would be. Assuming the correctness of the amount in circulation of the particular issue selected, as to which the facts were more or less known, then the total circulation would clearly be a multiple of the amount and proportion to the total of that particular issue. Other methods have been tried, but the principle of this

method of Jevons has been substantially used in almost all of them. It has been applied by M. de Foville, the Director of the Mint in France, and even on a more extended scale it has been applied by Mr. Harrison with reference to the rupee coinage in India. The difficulty in the latter case is that the counting only applies to coinage that is actually circulating—that is, passing from hand to hand with greater or less rapidity in the transactions of business; and for many purposes the issuing authority would require to know not merely the amount of this active circulation, but the amount hoarded as well, as to which, however, the method gives no information.

As is the case with the paper issues, there are the utmost variations in the amount and proportion of the coinages in use in different countries. In England the figures are very small, like those of the paper issues themselves. It is not believed that the actual circulation of gold coin outside the banks exceeds about 60 millions, while the circulation of silver altogether is probably no more than between 20 millions and 25 millions. The coinage may thus be about £2 per head of the population, exclusive of what is held in the banks. In France much larger figures are spoken of, so that France has more coin in circulation than England, as well as larger issues of paper. In the United States very large figures as to the gold in use are frequently spoken of. But as the calculations there appear to be based exclusively upon the issues from the Mint, and not upon any such method as that used by Jevons, it

may be doubted whether any real information exists as to the gold coinage in use in the United States, outside the Government Treasury and the banks. The circulation of silver coin again is known to be very small, as most of the coins are locked up in the Treasury. The whole facts being thus imperfectly known, it would be useless to attempt giving any exact expressions to the supposed facts as to the coinage in use in different countries.

As with the paper issues, the statistics that are of practical use in this matter relate to the movement of coin into and from the banks at different periods. As with the paper issues also, there are seasonal variations. At the very same dates that the paper issues increase it is found that coin flows out of the banks into the hands of tradesmen and customers all over the country, and the two movements synchronise. They are, in fact, movements of exactly the same kind, and their bearing upon the money market is followed in the same manner.

As we have already stated, the facts as to the bankers' clearing-house have become the most important with reference to the subject of currency and circulation. It is quite evident that the transactions of the country as a whole are mainly settled, not by means of issues of bank-notes, or by means of the coinage, but by cheques, of which a large part are set off against each other at the bankers' clearing-house, as it is called, so that no coin or paper actually passes. In England, during 1898, the total amount of cheques thus cleared at the London bankers'

clearing-house amounted to 8000 millions, which gives about 26 millions per working day for the cheques passed through the bankers' clearing-house alone. In addition, there is a bankers' clearing-house at Manchester, and it is also known that there is a large circulation of cheques payable by or to banks which are not members of any bankers' clearing-house, while a very large number of cheques also do not pass through any clearing-house because they are drawn by one customer of a particular bank and paid to another customer of the same bank, so that the clearing is effected inside the walls of that bank itself. It is stated by bankers who are likely to be well informed that the cheques which do not pass through the clearing-house in this country are probably as great in amount as the cheques which do pass through the clearing-house, so that the daily circulation in this way, reckoning by the amount of cheques actually paid in any one day, must exceed or be about 50 millions. Assuming the average life of the cheque to be not one day only, but even two days, we should arrive at the conclusion that the outstanding amount of cheques that are actually passing from hand to hand is not less than 100 millions, which makes it evident that it is the cheques which constitute the active circulation of a country like England or the United States, and not the issues of paper or the coinage. Cheque circulation has also this peculiarity, that it is all active, and extremely active, because the law requires that for safety the receiver of a cheque should pay it into the bank upon which it is drawn

at once, and neither the issues of paper nor the coinage can be quite so active. Further, the cheque circulation is capable of indefinite increase at any moment. Reference has already been made to the fact of the advances and deposits of London banks being increased in one day by the sum of 100 millions or more. Such an increase involves a momentary increase of the cheque circulation by a large amount, and could not take place, in fact, except by means of a system of cheques. The *ordinary* clearings at the London bankers' clearing-house, it may be added, vary from about a minimum of 20 millions to a maximum of over 50 millions per day.

Statistics of bankers' clearing-houses, accordingly, must be carefully followed, and are carefully followed, by those connected with the money market. An increase in the clearings is a sure sign of activity in business of different kinds, and a diminution in the clearings a sign of diminution of activity. It is also possible, by taking note of the different days on which cheques are cleared, to pick out the variations of the circulation in special departments of business. In England the days thus distinguished are the days of the fortnightly settlements on the Stock Exchange, really bi-monthly settlements; the Consols settlement, which is on a different day once a month; and the fourth of the month, which is the chief day upon which commercial bills in certain trades become payable. The statistics on these different days can accordingly be followed, and

supplement the information given by the aggregate clearings every week.

The figures of the bankers' clearing-houses in the United States are on much the same scale as those of the United Kingdom. The total clearings in the New York bankers' clearing-house also reach approximately the figure of 8000 millions sterling per annum. I am unable to say, however, whether the conditions are so much alike in the United States as to make a comparison with England quite legitimate. There may be a smaller proportion of institutions in New York outside the clearing-house than there is in London, while the smaller size of the banks in New York makes it likely that a smaller amount and proportion of cheques is cleared inside the walls of particular banks than is the case in London. These are matters, however, which do not affect the study of the bankers' clearing-house figures in other countries for practical purposes. It is the variations which have to be followed and studied. Nothing turns upon the rules or customs by which the average volume of the clearing is determined.

In no other country apparently is the system of clearing developed as it is in England and the United States. We cannot doubt, however, that there are clearings of different kinds wherever there are groups of banks working together. Probably in course of time the system of bankers' clearing houses is destined to receive great extension, until it becomes generally the case that the amount of coinage in use in a

particular country and the amount of the paper issues are matters of indifference compared with the work done at the clearing-houses of the bankers, and compared with the reserves of cash held by the bankers themselves. It is thus the amount of cash held by banks to which we always come back as the critical factor in the money market.

The remaining statistics to be noticed concerning the money market, that is, the production and movement of bullion, the prices of securities, and the facts as to production and trade generally, are not specially those of the money market. What is to be noticed here is rather the application of such statistics by those who study the money market itself.

It will be understood, however, that such statistics exist primarily for other purposes, although they are of very great importance indeed in the study of the money market itself.

The production of gold and silver and the precious metals has been the subject of long study, partly in the interest of the producing countries themselves, and the distribution and use of the product has also occupied the attention of experts. One may refer especially to the great work of Mr. Soetbeer, who has combined and digested the information scattered throughout many works, and whose book is thus the foundation of continuous studies that are now published frequently in the financial press. Looking at the matter historically, we find that immense changes have taken place of which merely the slightest indication can be given in a manual like the present.

Without going into ancient history we may notice, for instance, that early in the present century the production of gold was of comparatively small amount, being not more than from 2 millions to 3 millions per annum, at the rate of £3 : 17 : 10½ per standard ounce. In the 'thirties, however, this production began to be increased by the gold discoveries in Russia, and then in 1848–50 came the gold discoveries in California and Australia, by which the production was increased for a time to ten or twelve times the amount in the early part of the century. In the 'sixties and the 'seventies the annual production again declined till it reached the level of about 20 millions, and it remained at this low figure for a good many years. Again, however, within the last ten years, in consequence mainly of the discoveries in South Africa and West Australia, the production has again increased, till now it is believed to be upwards of 50 millions, with every probability of this figure being continued and even increased. The result has been, as a matter of fact, that gold has come much more largely into use as money and in other ways than was the case at any previous time in the world's history, and a certain party have come to favour, in consequence, the universal use of the gold standard for money. What has been already stated as to the connection between the abundance of standard money and higher rates for the loan of money and, *vice versa*, the connection between comparative scarcity of standard money and low rates for the loan of it, is no doubt the question

of main practical interest for the money market. The common impression, no doubt, is that with gold becoming abundant the money market will be easy, but experience rather seems to show that the contrary may be the case, and that at the present time the great abundance of gold may lead, as it seems to have done in the 'sixties, to difficult times in the money market and high rates for the loan of money. Altogether a greater movement may be expected, so that it will be necessary in the money market to follow what relates to the production and distribution of gold more carefully than ever.

Silver has had a somewhat different history. But there has been equally an enormous increase of production since the early part of the present century. There has also been a slackening of demand for silver in some directions in consequence of the increasing use and popularity of gold, although not so great a slackening of demand as has sometimes been represented. At present, it may be considered that the annual production of silver from being about 16 million ounces in 1811–30, is now on the average some 160 million ounces. This is not so great an increase as the increase in the production of gold, but the effect has undoubtedly been that in consequence not so much of the falling off of previous demands as of no increase of demands, such as have taken place with regard to gold, the relative values of gold and silver have greatly changed, and the ratio now instead of being $15\frac{1}{2}$ of silver to 1 of gold, has become more nearly 10 to 1. This would not be the place to enter

into the manifold discussion that has arisen between bi-metallists, as they are called, and mono-metallists. It is easy to understand, however, that so great a change as is thus briefly indicated in the relation between the two monetary metals may have given rise to a prolonged and heated controversy. It remains to be seen, also, what the fortunes of gold and silver may be in the future. It is by no means certain, in my view, that silver has definitely and finally receded in its use as money, and the position of silver in the money market will for many years to come require to be studied almost as much as that of gold.

With regard to the statistics of production and trade and the prices of securities, the main point of view from which they are usually studied in the money market is that of the indications which they furnish as to an active state of trade at one time, and a less active or depressed condition at another time. All the statistics in this view have a bearing upon the amount of the deposits at the central banks, and the cash reserve held against them. As trade becomes active and wages and prices rise, so do the amounts of deposits in the central banks increase, while the greater movement has a tendency to increase the note circulation of the banks and to cause a flow of cash from the banks into the outside currency. The same movement and the general prosperity appear also to increase the consumption of gold, or whatever may be the standard money, for other purposes. The symptoms are so regular that careful statisticians

have noticed in certain phenomena of production, of rates for money, of deposits in banks, and so on, the sure forerunners of a crisis in the money market. Similarly the continuance for a certain time of inactive trade and low prices, leads to a decrease of note circulation and to an influx of coin into the banks, along with a great increase in the prices of what are called high-class securities; and after a certain time these are found in turn to be the sure forerunners of a return to an activity in business. There is no need to give elaborate illustrations. Mr. Jevons' *Investigations in Currency and Finance* are full of them, and the theme is one which is repeatedly dwelt upon in Mr. Bagehot's *Lombard Street.* In addition to these I would also refer the student to Mr. Llewellyn Smith's evidence before a Committee of the House of Commons on the Unemployed, which sat in the years 1894–95, in which there were brought together for the first time many facts as to the ups and downs of business, showing that want of employment coincided with the depressed condition of trade indicated by the facts of the money market and *vice versa.* The outside student, it may be added, notices the different facts historically and *ex post facto*, but it should also be understood that the facts are being incessantly and carefully studied as they are developed, by practical business men in the money market as a guide to their transactions.

CHAPTER XIII

PRICES AND WAGES

The subject of prices and wages has already been referred to incidentally in connection with the statistics of production and consumption, of which it is, properly speaking, a branch. Values of what is produced and consumed and of the aggregates of commodities moved, which we find in the statistics of production and trade, are a most essential part of the study. Values, however, are dependent upon prices which are, in fact, values per unit, as distinguished from values in the aggregate. The reason for studying prices separately is that very often they can be known and many conclusions drawn from them, although aggregate values cannot be arrived at, while the aggregate values themselves are frequently pieced together from the facts as to prices and quantities which are independently known. Wages from this point of view, it may be explained, are merely a certain set of prices, the prices of so much labour. They are clearly so in fact in the case of piece wages, where the labourer is paid a price for so much work done, just as if he had supplied a commodity,

but in the ordinary case, where the wage is the remuneration of labour for so many hours, or days, or weeks of service, the payment is still in reality the payment of a price, although the unit may be somewhat variable and not capable of very exact measurement.

Statistics of prices and wages then are in their origin the records of markets, just like the record of market quotations of the rates for money given in the previous chapter, these market quotations for money being, in fact, prices of a certain kind. Every leading article of production has, in fact, a record of prices of the same nature. Wheat, cotton, wool, sugar, tea, coffee and the metals are all articles as to which ample market quotations are recorded; that is to say, where there are full records of prices. It is the same to some extent with wages. One of the chief functions of a trades union is to have a complete record of the prices in different localities for which its members will work, and the length of day according to which the price is to be reckoned, the price, it need hardly be added, being frequently put at so much per hour. When comparisons are made between the records for different times or between the records of different places, they furnish at once, it is obvious, a great deal of information both as to economic fluctuations and the causes of them, and as to the difference in economic conditions between different localities and different occupations. The utility of prices and wages statistics is consequently very great.

The data of such statistics, as a rule, are in their essential nature very good. The actual records are of a contentious kind, and are published daily and weekly and at other frequent intervals for the information of those most intimately concerned, so that they are constantly being checked. Whatever may be the doubts as to the meaning and interpretation of the records, they are like the other records of production and trade which we have discussed in previous chapters, absolutely complete and trustworthy in themselves. The information they supply is also, for the most part, to be found in financial newspapers and journals, and not in official publications. But in some cases governments have contributed to the formation of trustworthy records of prices which are useful over long periods. There are articles, like beef and mutton, for which it is frequently desirable not merely to have market prices of special qualities which can be continued from period to period, though that is not always easy, but to have records of the average prices paid by a large department for considerable quantities obtained year by year. Such prices can be best supplied by great contracting departments, like the War Office and the Admiralty, and the information given by Government is accordingly a useful addition to the records of prices. It is the same with wages. The Government as a large employer of labour is able to give records of the wages which it pays, and these records, when continued over several generations, as is now the case, become of obvious value for historical

purposes. There is another still more striking instance of an official record of prices. We refer to what are known as the Gazette average prices of corn. Here the Government for more than a hundred years has taken special pains to obtain and publish the average prices of grain, not wheat, barley, and oats merely, but at first other produce as well. For this purpose, the buyers and sellers of grain in different towns of the country, including not merely the principal towns, but some which are of minor importance, have been required to furnish to the officers of the Government particulars of their sales and purchases, specifying the amount sold and the aggregate price paid. These particulars, when consolidated, have given the average prices of wheat, barley, and oats week by week for more than a hundred years. With these few exceptions, however, the data as to prices and wages which have to be dealt with in statistics are not official in their nature originally, although, like other statistics, they may be made use of in official publications.

The use of prices and wages figures, for ordinary business purposes, requires no exposition. All buying and selling is, of course, a question of price, and the adjustment of price is what every business man is constantly engaged upon from day to day. What prices are being charged by one tradesman or another, or by one merchant or another, are the necessary topics of dealers as well as of private purchasers. It is in the further use of statistics for the information of public men and students of political economy that

the question of special compilation and adaptation arises, and it is necessary, therefore, to mention some of the principal uses to which the statistics of prices and wages have been turned, and to describe the way in which they have been made available.

One of these principal uses is to show from time to time what is called the statistical position of different articles. The factors of this statistical position consist mainly of the records of production and consumption, and of the amounts held in stock, but to these there has also to be added the record of price, because that record is necessary to the understanding of the changes in production and consumption themselves, as well as the changes in the amount of stocks held. Rising prices, when consumption is increasing and the amount of stocks held is diminishing, and, on the contrary, falling prices when consumption is not being maintained, and stocks held are increasing, are the usual rules. But the rules are not without exception: sometimes those concerned have to watch very carefully the varying relations between production, consumption, and stocks, and the prices of the commodities themselves.

It is an extension of this process as to the statistical position of particular articles by which the prices of commodities are employed to exhibit the changes in the purchasing power of money itself, money being a commodity like everything else. One of the things which has to be taken note of in connection with prices is clearly the changes which may go on in the average purchasing power of the money

in which the prices are reckoned; and a great deal of interest attaches to the efforts which have been made to exhibit such changes in the purchasing power of money. They are most interesting to every economist, because upon these he depends to some extent for a comparison of the economic phenomena of different generations and of different countries at the same time. When he reads, for instance, that at a particular period in the past the wage of an average workman was so many shillings or pence per week, the expression has no value for him unless he understands what the purchasing power of these shillings or pence was as compared with the purchasing power of the same number of shillings and pence at the present time. He must have a kind of scale, therefore, for estimating the purchasing power of money at different times.

Such a scale has been found in the shape of what are called index numbers, which are now very generally used. In order to reduce to a common denominator the prices of different articles, which may be quoted in a great variety of fashions, as so much per pound or per hundredweight or per ton or per gallon, and so on, the device has been adopted of substituting for a price at a given date the unit of a hundred, and then showing the prices at different dates by comparison in the proportion of so much to the original hundred. A fall of 10 per cent from the original hundred would thus be represented by the figure 90, and so on. When a number of these prices are put together also, the average change, or

A TABLE exhibiting the Prices of various Necessaries of Life, together with
derived from respectable Authorities; with the Depreciation of the
of 50 Years for the first 600 Years; and, during the present Century,

Year of our Lord.	Wheat per bushel.	Cattle in Husbandry.					Pou	
		Horse.	Ox.	Cow.	Sheep.	Hog.	Goose.	H
	s. *d.*	£ *s.* *d.*	£. *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	*s.* *d.*	*s.*
1050	0 2¼	1 17 6 **89**[1]	0 7 6 **20**	0 6 0 **37**	0 1 3 **29**	0 2 0 **36**	... ...	
1150	0 4½	0 12 5	0 4 8¼	...	0 1 8	0 3 0	...	0
1250	1 7¾	1 11 0	1 0 7	0 17 0	0 1 7	...	1 0	0
1350	1 10½	0 18 4 **43**	1 4 6 **66**	0 17 2 **106**	0 2 7 **61**	0 2 6 **45**	0 9 **75**	0
1450	1 5	...	1 15 8	0 15 6	0 4 11½	0 5 1	0 6¼	
1550	1 10½	2 2 0 **100**	1 16 7 **100**	0 16 0 **100**	0 4 3¾ **100**	0 5 6 **100**	1 0 **100**	0
1600	4 0½	...	...	...	...	...	...	
1625	4 11	...	...	...	...	...	2 0	
1650	5 6	...	...	...	...	...	...	
1675	4 6	5 10 0 **250**	3 6 0 **184**	2 17 0 **345**	0 11 0 **256**	0 14 0 **254**	3 0 **300**	1
1700	4 9½	...	...	...	...	...	...	
1720	4 4½	...	...	...	...	...	...	
1740	3 8	10 0 0 **476**	8 0 0 **437**	7 7 0 **884**	1 6 0 **602**	1 15 0 **634**	3 6 **350**	1
1760	3 9¾	14 0 0 **667**	8 10 0 **465**	7 0 0 **874**	1 7 0 **626**	1 15 0 **634**	5 0 **500**	1
1780	4 5½	...	...	...	...	...	...	
1795	7 10	19 0 0 **904**	16 8 0 **890**	16 8 0 **2000**	1 18 0 **882**	5 8 0 **1960**	3 0 **300**	1

[1] The black figures denote

. of Day Labour, in Sterling Money, and also in Decimals, at differ
ɜ of Money inferred therefrom. To which is added, the mean appı
horter Periods, deduced by Interpolation.

Cock.	Butter per lb.	Cheese per lb.	Ale per gallon.	Small beer per gallon.	Mean depreciation from these twelve articles.	Beef and mutton per lb.	Labour in husbandry per day.	Dep Wheat.
s. d.	*d.*	*d.*	*s. d.*	*d.*		*d. qr.*	*s. d.*	
...	...	...	...	...	...	...	...	...
...	...	...	...	...	**42**	...	...	**10**
...	...	...	...	..	...	...	0 2	...
0 4½	...	...	...	...	...	...	...	...
0 3¾	..	...	...	...	...	...	0 3	...
31	...	...	...	..	**56**	...	...	**100**
...	...	...	...	...	...	...	0 3¾	...
1 0	5	2	0 1⅓	1	...	1 0½	0 4	...
100	**100**	**100**	**100**	**100**	**100**	...	...	**100**
...	...	...	0 4	2	...	1 2	0 6	...
1 6	...	...	...	...	...	...	0 6½	...
...	...	...	0 4	2	...	...	...	...
1 3	4½	2	0 8	2½	...	1 3½	0 7½	...
125	**90**	**100**	**530**	**250**	**239**	...	...	**246**
...	...	...	0 10	3	...	...	...	...
...	...	...	1 0	3	...	2 2	0 8	...
1 6	9	3½	1 0	3	...	3 0	0 10	...
150	**180**	**175**	**800**	**300**	**434**	...	...	**197**
1 10	10	5½	1 2	3	...	4 2	0 11	...
183	**200**	**262**	**930**	**300**	**492**	...	...	**203**
...	...	...	...	...	...	...	1 2	...
1 6	11½	5	1 2½	2¾	...	5 3	1 5¼	...
150	**230**	**250**	**969**	**275**	**752**	...	...	**426**

rice in decimals, whereof those for the year 1550 may be taken for the integer, viz., 10

y, and also in Decimals, at different Periods, from the Conquest to the present Time, o which is added, the mean appreciation of Money, according to a series of Intervals olation.

Mean depreciation from these twelve articles.	Beef and mutton per lb.	Labour in husbandry per day.	Depreciation of money according to the price of				
			Wheat.	12 misc. articles.	Meat.	Day labour.	Mean of all.
	d. *qr.*	*s.* *d.*					
...	...	...	...	...	...	...	...
42	...	...	**10**	**42**	...	...	**26**
...	...	0 2	...	...	...	...	...
...	...	...	...	...	...	...	...
...	...	0 3	...	...	...	...	...
56	...	...	**100**	**56**	...	**75**	**77**
...	...	0 $3\frac{3}{4}$	...	...	...	...	...
...	1 $0\frac{1}{2}$	0 4	...	...	...	...	...
100	...	...	**100**	**100**	**100**	**100**	**100**
...	1 2	0 6	...	...	...	...	...
...	...	0 $6\frac{1}{2}$	...	...	...	...	...
...	...	...	...	...	...	...	...
...	1 $3\frac{1}{2}$	0 $7\frac{1}{2}$	...	...	...	...	...
239	...	...	**246**	**239**	**166**	**188**	**210**
...	...	...	...	...	...	...	...
...	2 2	0 8	...	...	...	...	...
...	3 0	0 10	...	...	...	...	...
434	...	...	**197**	**434**	**266**	**250**	**287**
...	4 2	0 11	...	...	...	...	...
492	...	...	**203**	**492**	**400**	**275**	**342**
...	...	1 2	...	...	...	...	...
...	5 3	1 $5\frac{1}{4}$	...	...	...	...	...
752	...	...	**426**	**752**	**511**	**436**	**531**

Mean appreciation by interpolation.	
1050	26
1100	34
1150	43
1200	51
1250	60
1300	68
1350	77
1400	83
1450	88
1500	94
1550	100
1600	144
1650	188
1675	210
1700	238
1720	257
1740	287
1750	314
1760	342
1770	384
1780	427
1790	496
1795	531
1800 nearly	562

50 may be taken for the integer, viz., 100.

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the mean change rather, can be shown by adding together the different numbers at the fresh date. The difference in the aggregate amount from the aggregate of the hundreds in the basis of the index number shows the average change of price, and can easily be stated in the form of a percentage. The invention of this method, as far as I can make out, is to be ascribed to Sir George Shuckburgh Evelyn, who read a paper at the Royal Society more than a hundred years ago,[1] showing historically, for England, what the changes in the purchasing power of money had been. For historical reasons, and in order to show clearly what the idea is, the table given by Sir George Evelyn may here be repeated (see folding table).

In modern times the idea has been very much developed. Mr. Jevons used it in his paper showing the fall of gold after the Australian and Californian gold discoveries, published in 1863. Afterwards, Mr. Newmarch employed similar index numbers in the annual *Commercial History and Review* of the *Economist*, showing the changes from year to year in the average prices of the leading wholesale commodities; that is, the average changes in the purchasing power of money as measured by these commodities. At a later date, Mr. Sauerbeck intro-

[1] "An account of some Endeavours to ascertain a Standard of Weight and Measure," *Phil. Trans.* vol. 188, 1798, p. 133. The paragraphs on index numbers occur at the end of the paper, pp. 175-6. In a footnote to the text it is stated that "the various changes that have taken place, by authority, in different reigns, either in the weight or alloy of our coins, are allowed for in the subsequent table." A footnote to the table, not reprinted, cites some of the authorities used.

duced a similar index number, which has now become very well known. Mr. Soetbeer again, in his studies upon the production and consumption of the precious metals, applied the principle of the index number to the prices of commodities in Hamburg for a long series of years, and similar applications of the principle have been made with regard to prices in India and to prices and wages in the United States for a long series of years. A Committee of Section F of the British Association in 1887–89 gave special attention to the subject, discussing the principles upon which index numbers should be formed, and entering into various refinements in connection with them, the broad conclusion being that trustworthy results were to be arrived at as to the average changes in the purchasing power of money by the mere chance selection of a limited number of articles of production and consumption, without any weighting of the different articles according to their relative importance, or supposed relative importance. I do not propose here to enter into all these details, and I refer those who desire to follow up the subject principally to Mr. Jevons' discussion in his papers of 1863 and 1865; to the evidence which I gave before the Royal Commission on Gold and Silver in 1887; and to the reports of the Committee of the British Association, above mentioned, in which the history of the matter and the pros and cons as to how index numbers can be made and how they should be used are discussed.

With regard to wages it is to be noticed that a very great advance in the study has been made in a

comparatively recent period. Formerly, the records of wages were used mainly for the primary business purpose of informing those who had contracts to make, no further use being thought of; and the greatest difficulties were experienced in making comparisons over a series of years, from the necessary changes in the character of labour itself, when more or less distant periods were compared, so that the same designations no longer meant the same thing. Confusion also arose from the fact of the labourer very often in former times being only paid partially in money and by a regular sum per week, his other payments being in kind or in irregular amounts at harvest and other times, while those who recorded the facts, at different periods, did not always state whether the wage they were quoting was the regular money-wage merely or the average earnings per annum. Now in consequence of the studies of the Labour Department at the Board of Trade and the Labour Departments in the United States and elsewhere, it has become perfectly well understood that there are various elements to be taken account of in dealing with wages; that the normal or usual or weekly wage is one thing, and that the aggregate average earnings of a working man, allowing for overtime, irregular payments and payments in kind, and also for slack time, is quite another thing; while both figures may be wanted for purposes of economic discussion. In showing the history of wages also, or in comparing the wages of different countries together, it has also become quite well understood that

comparisons are not merely to be made between one rate and another, but that it is an essential part of the case to consider the numbers at different rates of wages in order to deduce correct averages, while it has been found by experience that variations in the proportionate numbers at different rates may lead to considerable differences in average wages, although there may not be much difference between the mean of the different rates themselves.

The use of index numbers with reference to the purchasing power of money, and also in comparing the courses of wages and prices generally, has been very great in the discussions of the last twenty years. The bi-metallic controversy has had a great deal to do with this extension, one of the leading topics of the bi-metallists having been the increase in the purchasing power of gold since 1872–73. It seems to me established beyond a doubt that there was a diminution of the purchasing power of gold on the average between 1848 and 1862, the date at which Mr. Jevons wrote, and that while this diminution of the purchasing power of gold on the average continued down to 1872, yet after the latter date there was a change in the opposite direction, and the average purchasing power of gold, as measured by wholesale commodities, increased. For about ten years or so, however, there has been comparatively little movement. There has been much discussion as to the causes of the change, and Lord Farrer and others seem to think that it was a great point for them to make that the causes of the move-

ment were not in the gold but in the commodities. But for the more general statistical view of the matter a good deal of this discussion would appear to have been irrelevant, because the question being one of ratio, no distinction can be made between what happens to one of the articles in the ratio and what happens to the other. It is the ratio that is affected by every event in both cases. In any case, the question of the changes in the purchasing power of money, which is the point of view of the economist, and the point of view from which index numbers have been made use of, is not at all concerned in these latter discussions. It seems more interesting to consider what are the changes that have occurred in wages in comparison with other prices. In the first index number of Sir George Evelyn, above quoted, it will be observed that wages of labour are introduced as on all-fours with the prices of commodities, but modern experience proves that in a progressive country, at any rate, the wages of labour and the prices of commodities need not move *pari passu*, and that, on the contrary, the most important conclusions may be drawn from the fact that while prices go one way, as seems to have been the case in the last thirty years, wages are either stationary or go the opposite way, so that as the purchasing power of money increases, the real remuneration of labour also increases. The comparison of wages and prices in the last thirty years, therefore, of itself indicates a great improvement in the economic condition of the people, not merely in this country but generally throughout

Europe and in the United States, and there are few economic facts of greater importance in history.

In a paper which I read to the Statistical Society in December 1888, on recent changes in prices and incomes compared, the whole question of the opposition that may exist between the prices of commodities and the prices of labour, which we call wages, was fully discussed. I am not aware of any previous discussion or of any very formal mention of the point in economic literature, but the opposition is now well understood, and the idea helps to make clear a great many questions as to the economic condition of people in different countries and at different times in the same country. Though we can speak of the price of labour theoretically, there is yet an essential difference between it and the prices of other commodities, because in an industrial community the wage is another way of expressing the average income of the members of the community, and their economic condition cannot be fully shown without comparing the prices of the chief commodities they consume, so as to show the purchasing power of their income.

The prices of securities are of so special a kind that, although they may be classed with other prices, a security in this sense being a commodity, just like a pound of tea or of cotton, yet a security differs from other commodities in the fact of its being property yielding interest or dividend, and it is thus specially connected, as we have seen in the previous chapter, with the rates for the loan of money in the money market itself. The prices of securities, therefore,

are continually being studied by the vast class of dealers and other members of the Stock Exchange and the customers, whether capitalists or speculators, who are more or less connected with that institution, and who form a very numerous class indeed. The causes which may influence prices from day to day or over longer periods, and chief among them the state of the money market, are the theme of endless consideration, the peculiarity being that every security is acted upon, not merely by general causes acting on all securities, but by causes peculiar to itself or to the class to which it belongs. It is partly from the facts thus arrived at that the question of a general rise or fall in the amount of income obtainable from investments, which is another form of the question of a general rise or fall in the value of money itself, has been discussed. One of the most obvious facts in studying the markets for securities in recent years is the great advance which has taken place in the prices of the best securities, such as Government stocks, railway debentures and preferred shares, corporation stocks, and even the ordinary shares of railways and other companies. It is obvious that this phenomenon must be connected with the similar average fall in the rates obtainable for the loan of money, and the two facts confirm each other. It is a speculative question whether or not the fall will be continued, and much will depend apparently on the question whether the purchasing power of the money as measured by commodities will itself increase or diminish. But in answering the speculative ques-

tion it is the history of prices which must be appealed to, and it will be the records of prices carefully studied which will give the answer in future.

It is an evidence of the interest which is taken in these matters that for a good many years past an attempt has been made to exhibit the average changes in the value of securities quoted on the Stock Exchange by means of an index number. The amount issued of a long list of securities is multiplied in each case by the price at a given date, say once a month, and then the average values so obtained are added together so as to make a total sum which can be compared with similar totals at the dates selected for comparison. It has been shown by these figures that, notwithstanding the immense fluctuations which sometimes occur in special securities on the Stock Exchange, yet the average value of all securities does not change, as a rule, from month to month by more than a very small percentage, and the difference in the amount or the aggregate change, whether large or small, usually corresponds to the periods of activity on the Stock Exchange or the reverse. The figures which have been thus published have been given by a publication called *The Bankers' Magazine*, and for a series of years they have been as follows:

[TABLE

Bankers' Magazine Index Number of Stock Exchange Securities (value in Millions Sterling of 334 Representative Securities in 1894–95 ; 325 Securities in 1896–98).

	1894.	1895.	1896.	1897.	1898.
January .	2740	2906	3123	3224	3291
February .	2765	2915	3197	3191	3285
March . .	2777	2914	3189	3193	3233
April . . .	2790	2927	3222	3178	3164
May . . .	2791	2943	3249	3240	3173
June . . .	2807	2952	3279	3256	3215
July . . .	2816	2969	...[1]	3261	...[1]
August . .	...[1]	2972	3272	3261	3225
September .	2885	2990	3202	3262	3227
October . .	2844	2985	3156	3263	3196
November .	2866	2927	3197	3268	3206
December .	2882	2951	3198	3276	3241

[1] Not calculated.

Before leaving the subject of prices it may be useful to explain that the records are not always records of the same sort of fact, but that there are often differences, which may become important, in the meaning of different records. As we have seen, there are prices, like the Gazette average prices of grain, or like the contract prices of grain-purchasing institutions like the War Office and the Admiralty or leading hospitals, which represent nearly the average results of sales and purchases in the mass. The usual price quotations, however, have obviously nothing to do explicitly with mass results. They are prices per unit and nothing more. Still more, these prices per unit may sometimes be very satisfactory as records of contentious, well-established facts.

In a very active speculative market, where there is a large amount of dealing, the price quotations from day to day are clearly such records. They are statements in reality of what is being actually done in the market, although they may take the form of quotations by the leading dealers as to the price at which they are willing to do business. On the Stock Exchange there is, in fact, a record of the prices in each security at which business is really done from time to time, as well as a record of the quotations at which dealers are willing to do business. In active markets, therefore, and for prominent securities, the prices, whether those of actual business done or merely the quotations of the dealers, are fairly trustworthy, and may be taken to represent the actual course of dealings upon a given date. The same is true as regards the markets for leading commodities like grain or cotton or sugar. It happens frequently, however, especially on the Stock Exchange, that there are articles in which the actual dealings are few and far between, but as to which, nevertheless, the dealers issue each evening (or more frequently) quotations at which they are willing to do business, and here it may not be always the case that the quotations represent any real fact. When the market comes to be tested by actual business, the price may either rise or fall considerably as compared with the nominal quotation just before. Still worse, there are bogus securities and bogus quotations which represent no real or genuine dealings. It must not be supposed, therefore, that all prices or price quotations are on the same footing, and the

student must be careful to consider in each case whether the price before him is a thing which he can rely upon for the purpose for which he intends to use it.

Another obvious distinction to be made is that between wholesale and retail prices. In the case of commodities the markets are better organised and the price quotations are closer for wholesale markets than in retail business; in fact, retail business is sometimes conducted in such a way that except for long periods and with a wide average and with a large mass of retail prices, it might not be very safe to draw conclusions from the available records. It is found to be the same on the Stock Exchange in the prices for securities. There is a custom in each security as to the magnitude of the lump of the securities in which a bargain would usually be made between members in the absence of any specific statement of amount. But it often happens that a deal is wanted in a larger mass, sometimes a much larger mass, or that specially small amounts are required for investors, or are sold by orders. In these cases special prices have sometimes to be made, and in Wetenhall's List, the list of the Stock Exchange, there is frequently a note appended to a statement of business done to this effect: "Exceptional amount at special price," or to this effect: "Small bonds only." These are undoubtedly niceties to which the student of economics as a rule needs to give little attention, because his business is mainly with the more important securities which are dealt in on a

large scale. But they are points of obvious importance when inquiries in detail have to be followed up, and they are points of interest to the public; for statements are frequently made as to changes in the price of special securities, which may sometimes turn out to be altogether non-existent, the record being misleading to the uninitiated.

CHAPTER XIV

STATISTICS OF ACCUMULATION

CONNECTED with the statistics of production and trade, of the money market, and of wages and prices, we have the statistics of what is called accumulation; that is, statistics of the capital of a community or of sections of a community, and of the increase or decrease of that capital in given periods. With these are included comparative statistics of the accumulation in different communities. On analysis, however, we find that we have here to deal not so much with a separate branch of statistics, as with a study based entirely upon deductions from the other branches of statistics already referred to. The facts as to the amount of capital in existence and the growth of capital are, for obvious reasons, of special interest to bankers and to other classes concerned with investments. To a certain extent, especially, the facts as to the increase of capital throw a light on the conditions of the money market, and they might accordingly with some propriety be included as a department of the statistics of the money market. They extend, however, in various directions, throwing light upon

various problems as to the condition of the community, so that it is necessary to study them by themselves, and not merely in connection with money market statistics, or any other branch of statistics from which the data are derived.

There is here then no question as to the data of the statistics to be considered, as any question of this kind would belong to the branches of the statistics from which the data are derived. We may simply enumerate the different kinds of facts which are made use of in showing the amount of capital in a community, and the changes in the amount from time to time.

There are first of all figures as to the deposits in banks. We have seen already that the deposits in banks are necessarily represented by cash or investments or loans on the other side. As the deposits increase, therefore, so do the assets by which they are represented, and other things being equal, the increase in the deposits is an index to the increase of capital in a community. The deposits in savings banks also appear to be of special value in this connection. The deposits in ordinary banks are necessarily mixed up with the balances at the credit of current accounts, and sometimes, as we have seen, consist of sums which have previously been placed to the credit of the depositors by loans of the banks themselves. The deposits in savings banks, however, are, as a rule, permanent deposits constituting a surplus in possession of the depositors, and the increase of this surplus is accordingly an index to the capital available for

investment from time to time in that form. Along with these figures there are also the figures of the accounts of Friendly Societies, Building Societies, Co-operative Societies, Insurance Companies, and so on. All these associations are directly connected with the business of accumulating and investing capital; some of them specially concerned with the accumulation of particular classes of the community, but all of them being more or less directly investment associations. Taking them altogether, and comparing one with the other, the student undoubtedly finds in such figures indications of what is going on in a community in respect of the accumulation of capital, indications which are undoubtedly useful for comparisons between different periods, although it is not possible to derive from them any complete account of the total saving or accumulation at a particular date or over a particular period.

The next source of information as to the amount of capital and the progressive accumulation of it in a community is furnished by one or two of the taxes, which have already been considered in connection with the statistics of finance. The two descriptions of taxes which are especially useful for this purpose are what are called the death duties and the income-tax. The death duties being levied upon the amount of property passing at death, the result is that in the assessments for the duties the Government has a certain record of the amount of property in the hands of private individuals, which would indeed be an absolute guide to the total amount of property in

the country if it were possible to ascertain the proportion between those who die annually and those who hold property. How this can be ascertained is a subject which has been a good deal discussed among statisticians, and to which reference will afterwards be made. But apart from the ascertainment of this proportion, it is plain that if a record were kept of the assessments of property passing at death over a long series of years, they would supply a more or less perfect indication of the growth of capital in the community. It is an obvious consideration that accident may vary the amount of property passing at death in given years, owing to the special effect which the death of a few very rich people might have in throwing up the assessments for those years. But making averages for a series of years, variations due to such a cause could obviously be allowed for, and the result would be that in these figures as to death duties we should have an index number showing the progressive growth of capital in a community.

Of course, in constructing and making use of such an index number, care would have to be taken to note any changes that may be made in legislation, altering the proportion of property passing at death which is returned to the department levying duties. Such a change has occurred lately, in fact, with reference to the property in this country subject to that description of death duty called the "succession duty." For many years the succession duties used to be levied in such a way that only a portion of the property passing at death was assessed and made

subject to duty. By the legislation of the last few years the whole of such property passing at death has been made subject to duty. Comparisons between the facts at the present time, therefore, and those of former periods cannot be made directly or without allowance for this change in legislation.

There is also a curious permanent difficulty in the matter of records of property passing at death. Strict accuracy would require that a record should be kept of all the people possessing property dying within a year, and then that the property when ascertained should be treated as having passed in that year. But to achieve this strict and formal accuracy there must be great delay in ascertaining and publishing the results, wills often not being proved till long after a death, and even greater delays occurring in correctly ascertaining the property. It is more convenient, then, for the Department simply to record the amount of property upon which they are able to charge duties and of which they receive notice within a given year. Although the property thus recorded is not the property of persons actually dying within the year, yet it comes to the same thing in the long run whether the number of persons dying within a year and their property are made subject of record, or whether the amount of property actually brought to the notice of the Department levying the duty within the year is taken. At one time it may be noticed that what the Department returned was not even the latter figure, but the amount of property actually paying duty in the year,

and in the case where the payment of duties was spread over a long period it was a long time before the property actually passing in a particular year was brought to charge. Even in the latter case the results must have equalised themselves in time, but the tendency would be for the record of property passing at death in a given year to be rather less than it ought to be, as so much of the property represented was not the property actually passing in that year, but property which had passed long before, while the property passing in the year would not itself be recorded until long after. The effect of this arrangement in a progressive country necessarily would be to make the returns for a particular year a little less than they ought to be. Now, however, the Department records and gives statistics of the property of which it receives notice in a given period.

The other source of information as to the capital of a country is the income-tax. This is a tax which is, of course, levied upon incomes at a certain rate, and the assessment of incomes consequently does not say anything directly as to the amount of capital. Practically, however, in the assessment of the tax the different descriptions of income, whether derived from personal services or from property, are classified; and where derived from property the different descriptions of property are also classified. Hence it becomes possible by means of the income-tax assessments to apply a certain number of years' purchase, according to the best estimate that can be formed, to the different descriptions of income from property, and by

this means an estimate of the capital yielding income can be arrived at. There is, no doubt, some difficulty in establishing what the multiplier in each case should be. The only complete method of arriving at a true account would be to go over all the assessments in minute detail, value them separately, and then add them up to arrive at a total. But such a procedure is not really necessary to approximate accuracy. Great masses of the property are in such a form, for instance railway shares and stocks, that any one with a knowledge of market conditions can easily apply an approximate figure by which the total income may be multiplied so as to show the capital represented at its market value. Such a method, though not absolutely correct at any given period, may obviously be highly useful when comparisons are made between widely different dates. Here also, as is the case with the death duties, special precautions have to be taken against changes by legislation at different times affecting the amount of income assessed. But on the whole the changes affecting the income-tax do not appear to be so serious as those affecting the death duties. The changes chiefly affect the lower limit of incomes liable to taxation, and they hardly touch the actual returns of income arising from property. These incomes are ascertained in the gross in such a way that the question whether they are subject to duty or not does not arise until afterwards, when those who are below the limit claim to be relieved of a tax which has actually been charged. Meanwhile, however, the income arising from the property has

been ascertained, and this fact remains on record in spite of subsequent exemption from the duty. Adding to the amount of property ascertained from the income-tax returns estimates of the property in the country not yielding income, calculations as to the total amount of property in a country can be made at different times and compared.

In this way, then, from the death duties and from the income-tax, records can be obtained of the amount of property existing in a country at different times, and this may be the basis of estimates of the accumulation going on in different periods. It has to be observed, however, that there is a necessary distinction between an increase of capital shown in this manner, and a record of the actual saving or investment in the same period. A valuation of the investments in a community at a given date, according to market values, takes no note of the causes of any change that may have occurred in the interval that has elapsed from the date of a former estimate. It is obvious that in the interval capital may not merely have been saved and invested, but may have been lost. A bridge, for instance, may have been destroyed, and there is so much capital lost; or the machinery in some particular factory or works may have been superseded by new inventions, and so the old property loses its value altogether. Shipping supplies a good illustration of the rapidity with which capital may lose its value. In consequence of changes in the types of ships built and in the construction of boilers and engines,

it is probable that few ships built twenty or thirty years ago can be compared in efficiency with a modern ship, perhaps built at a much less cost. The whole of the value in the old ships, therefore, is impaired, and sometimes may be so much impaired that the ships become good for nothing but to break up. On the other hand, in the case of other property, owing to the existence of monopoly and other reasons, the actual value at a given date may greatly exceed any amount of capital that has been put into the property since the time of a former estimate. The selling value, in other words, has greatly increased without any change in the capital actually sunk. In this way, then, it comes about that a difference between two valuations separated by a considerable interval of time does not in any way represent the investments during the same period of time, although the two figures may approximately correspond.

The question may arise, Which is the more correct figure to take to show accumulations—the actual savings over a given period as derived from the direct record of such savings, or the difference in the valuations themselves, which has no direct relation, as we have seen, to the amount of the savings? I can merely suggest that both methods ought to be made use of and compared. Neither is complete in itself. The record of savings would perhaps be the most complete if we could join to it a record of losses by deterioration or actual destruction and deduct the one from the other. Even that would not be quite

satisfactory, because the saleable value of an article has to be considered as much as any other point connected with capital, the money expression of capital being in no way an absolute thing. At the same time the difference between two valuations is obviously unsatisfactory by itself in a question of accumulation, as there are various causes for such a difference, irrespective of the actual savings that may have taken place in the interval. All that can be done, then, is to make comparisons in different ways so as to bring out as near as possible what has actually happened between two different dates.

One of the chief causes of a difference between the valuations at two different dates, which may arise irrespective of a corresponding increase or decrease of actual investments between the two dates, is a change in the purchasing power of money. If in any period there is a diminution generally in the purchasing power of money as measured by commodities, the effect will be to increase enormously the valuation of property in the interval. If, on the other hand, there is a great increase in the purchasing power of money between two dates, the effect will be rather to check the increase of the value of the property as expressed in money in the interval. Accordingly, one of the points to be considered in dealing with this question of accumulation is the change that may occur from time to time in the purchasing power of money. The facts, when properly studied in connection with all the other factors as to production and trade, and as to wages and prices,

tend to show by a reverse process what are the changes in the purchasing power of money itself.

An important point has also to be stated in connection with the study of accumulation—this is, that investments are made simultaneously with the savings themselves; and next, that they are largely made by private individuals or companies in con nection with their own business. The popular notion—justified to some extent by actual experience in private affairs—is that money is accumulated first of all and then an investment is found for it. In business, however, very often there is no previous accumulation of the money. A man in business finding himself prosperous, with his commitments growing and orders coming in, immediately engages in operations to increase his plant, and where this is done out of the profits the investments are actually made as the profits come in. Private people also, saving out of their own incomes, are hardly aware at times of the savings which they do make either in buying a house, or investing largely in furniture or in some other way by which their surplus income is immediately invested as it is saved. Still more generally the free income which accumulates in the shape of deposits in the banks is itself to a large extent invested as it is saved. It is very seldom found that cash accumulates in the banks to any great extent in comparison with the enormous operations of investment which go on from year to year. Bankers and investors, therefore, taking the whole class together, are continually investing the

savings which are made, as they are made; sometimes one hears of an accumulation of money waiting for investment, but when the facts are analysed it is found very often that the money is already invested and is used to carry on certain undertakings. The money is lent by the banks to speculators or people of enterprise who carry on the undertakings with the borrowed money. What happens when the accumulation of money waiting for investment is dispersed is very often nothing more than the actual purchase, by the people who have deposited in the banks, of those undertakings which the same money has previously carried on by being lent through the banks to the speculators and people of enterprise. It is a material impossibility under modern conditions of business that any great surplus can remain uninvested at a particular moment, although the form of the investment may be changed considerably. The forms of investment in different channels form a very interesting subject for inquiry by themselves, especially the question how much is invested by private individuals or companies in the course of their own business, and how much comes into the banks and through them to the Stock Exchange for investment in public securities.

I propose to give a very few illustrations only of the kind of facts which are more or less accurately ascertained in studies with regard to accumulation. I trust also that I may be excused for referring to my own writings, as they happen in fact to have dealt with this subject at some length, and I am not aware

of any other essays in this country in which the method is treated and some account given of former attempts in the same direction. The first essay on the subject which I wrote took the form of a paper read at the Statistical Society in January 1878, entitled "Recent Accumulations of Capital in the United Kingdom," dealing specially with the increase shown by the income-tax assessments between 1865 and 1875. This paper was continued, enlarged, and expanded in a book entitled *The Growth of Capital*, published in 1889.[1] In this book the figures as to the income-tax were carried down to the year 1885, and in addition there was a general review of statements as to the growth of capital in this country during the last three hundred years, and a review of some statements in foreign countries as to the growth of capital there, besides a discussion of the general uses to which such valuations of the capital of a country can be put.

I extract from this book then (p. 110) a short table exhibiting the growth of property in this country at different dates during the last three hundred years. The first part of the table relates to England merely, down to the year 1800, and the rest of the figures, being mostly for the present century, are for the United Kingdom. The omission, however, of Scotland and Ireland from the earlier figures would not make a great deal of difference, except perhaps by reducing a little the average amount of property per head, as both Scotland and Ireland at those early dates,

[1] London: George Bell and Sons.

especially Scotland, were not of much account in respect of the amount of property in the country. The following is the table:

GROWTH OF CAPITAL AND POPULATION IN ENGLAND AND THE UNITED KINGDOM SINCE 1600. (In round figures.)

Year.	Population. Millions.	Property. Millions sterling.	Property per head.
ENGLAND—			
1600 (British Merchant, etc.)	4½	100	£22
1680 (Petty)	5½	250	46
1690 (Gregory King, Davenant)	5½	320	58
1720 (British Merchant)	6½	370	57
1750 (various)	7	500	71
1800 (Beeke)	9	1,500	167
GREAT BRITAIN—			
Beeke	11	1,750	160
UNITED KINGDOM—			
1812 (Colquhoun)	17	2,700	160
1822 (Colquhoun-Lowe)	21	2,500	120
1833 (Colquhoun-Pablo de Pebrer)	25	3,600	144
1845 (Income-tax)	28	4,000	143
1865	30	6,000	200
1875	33	8,500	260
Present time	37	10,000	270

As remarked in the book from which this table is extracted, the changes here shown are constantly in an upward direction, with the exception of the short period between 1812 and 1822, when allowance had to be made for a fall in prices. In spite of doubts also as to differences in the method of making the valuations which are fully discussed in the book itself, it seems plain that for comparative purposes over a

long period the valuations can be so far trusted that the account of increase may be considered to be approximately correct. A doubt may be suggested as to whether part of the advance in valuations from time to time may not be explained by the rise in prices which undoubtedly took place in the seventeenth and the eighteenth centuries, especially the latter part of the eighteenth century, but I can only repeat the remarks made upon the table itself in the book from which I am quoting (p. 111):

> On the whole there is a vast real advance as well as nominal advance all through. As already remarked, as far as the increase in the present century is concerned, comparing the latest with the earliest date, no part can be ascribed to the rise of prices, since prices are now at the lowest level on which they have been since the beginning of the century. There may have been some such rise affecting the values of 1865 and 1875, but that rise has since been lost, and comparing the present time with a date like 1812, and perhaps 1800, there is undoubtedly a fall of prices.

On a further review of the growth of capital throughout a long series of years, differences are at once apparent in the proportion of different kinds of property held by a community. In the case of this country the interesting point in the history is the great proportion held by property in land at the beginning of the period and the comparatively small proportion at the present time, the whole difference exhibiting the transformation of the country in the course of centuries from an agricultural into a manufacturing and commercial country. The book from which

I am quoting contains the following table (p. 111) as to two items, "Land" and "Houses," which brings out very clearly the nature of this transformation :

SUMMARY SHOWING THE GROWTH IN VALUE OF LAND AND HOUSES AND THEIR PROPORTION TO TOTAL PROPERTY.

Year.	Land.		Houses.	
	Amount in millions sterling.	Proportion per cent of total.	Amount in millions sterling.	Proportion per cent of total.
ENGLAND—				
1690 (Gregory King)	180	60	45	15
1800 (Beeke) . .	600	40	180	15
UNITED KINGDOM—				
1812 (Colquhoun) .	1200	44	400	15
1865 . . .	1864	30	1031	17
1875 . . .	2007	24	1420	17
1885 . . .	1691	17	1927	19

Upon this the following comment is made :

Thus, lands, from constituting at the beginning of the period 60 per cent of the property of the country, and while forming as late as 1865 about 30 per cent of the property, do not now constitute 20 per cent of the total, there having also been in the most recent years an absolute decrease in amount, while other capital is increasing. Houses, on the other hand, maintain a rather increasing proportion of a total property, which is itself constantly increasing in amount; and in the last period of all this tendency has been accentuated till houses—buildings—have come to constitute a fifth part of the total property of the country. Changes like this have undoubtedly been in progress. The proportion of individual property held in land

has been steadily diminishing, other property increasing by leaps and bounds, while land, though participating in the unearned increment, has improved more slowly, and of late years has diminished absolutely in value, owing to the unearned increment having for the moment disappeared under the influence of foreign competition. At the same time the progress of civilisation is steadily marked by the growth and improvement of buildings, which increase not only with population and the increase of property generally, but in even a greater ratio.

In later studies on the subject attention may be given in more detail to the growth of new kinds of property in the United Kingdom, such as railways, or mines or other special kinds of property, but great difficulties of classification, owing to the complexity of property arrangements, will undoubtedly arise. The above statements are merely quoted by way of illustration of the uses to which such figures can be put.

Without going with any minuteness into discussions as to the growth of value in foreign countries, I propose to extract from the same volume (p. 125) the following statement as to the growth of property in the United States, where special attention has always been given to such valuations on account of the method of taxation followed, which is largely taxation upon the capital value of property. The official valuations have come to be, in many States at least, very inadequate, but they have led to an extensive study of the subject, and in the decennial census an attempt is always made to give a real as well as an official valuation of property. It is from such

statements in the census that the following table is compiled:

STATEMENT SHOWING THE POPULATION AND WEALTH OF THE UNITED STATES BY DECADES FROM 1790 TO 1880; DECENNIAL PERCENTAGE INCREASE OF POPULATION; DECENNIAL PERCENTAGE INCREASE OF NATIONAL WEALTH; AND AVERAGE PROPERTY TO EACH PERSON (see table, p. 186 of *Essays in Finance*, 1st Series):

Year.	Population. Millions.	Wealth. Million dollars.	Decennial percentage increase.		Average Property to each person. Dollars.
			Population.	Wealth.	
1790	3·9	750 (estimated)	...	...	187·00
1800	5·3	1,072 „	35·02	43·0	202·13
1810	7·2	1,500 „	36·43	39·0	207·20
1820	9·6	1,882 „	33·13	25·4	195·00
1830	12·8	2,653 „	33·49	41·0	206·00
1840	17·0	3,764 (official)	32·67	41·7	220·00
1850	23·2	7,136 „	35·87	89·6	307·67
1860	31·5	16,159 „	35·59	126·42	510·00
1870	38·5	30,069 „	22·00	86·13	776·96 [1]
1880	50·1	43,642 „	30·13	45·47	870·00

It is pointed out in the book cited that these figures with reference to the United States are subject to a certain reduction on account of foreign capital invested

[1] Allowance ought to be made here for the depreciation of the dollar between 1860 and 1870. In the introduction of vol. vii. of the *Tenth Census of the United States*, p. 8, it is also stated that between 1860 and 1870 allowance ought also to be made for the fact that slave property is included in the former census, and had disappeared in the latter. Mr. Gannett suggests that, excluding slave states in 1860, as well as in 1870, and allowing for the depreciation of the dollar in 1870, *i.e.* reducing the values of that date to gold values, the more approximately correct figures of the true valuation for 1860 and 1870 would be:—

1860 . . . 9,253,000,000 dollars.
1870 . . . 23,973,000,000 „

I have thought it more convenient, however, to retain the official figures in the text. It brings up to a point what is said elsewhere as to the importance of price in these valuations.

in the United States, while various corrections are suggested in connection especially with the values in 1870 (see footnote), owing to the money of the country at that time being depreciated inconvertible paper. It seems unnecessary, however, for our present purpose to go very much into such details, our main object being to exhibit to the student the kind of information available to him when he prosecutes a study of the subject and the nature of the books to be consulted. With these figures may be compared a statement at p. 117 of the same book, showing how the true valuation according to the census of 1880 is made up:

"TRUE" VALUATION OF THE UNITED STATES ACCORDING TO THE CENSUS OF 1880.

	Million dollars.	Millions sterling.
Farms	10,197	2,039·4
Residence and business real estate	9,881	1,976·2
Railroad and equipment	5,536	1,107·2
Telegraphs, shipping, and canals	419	83·8
Live stock, farming tools, and machinery	2,406	481·2
Household furniture, paintings, books, clothing, jewellery, household supplies, food, fuel, etc.	5,000	1,000·0
Mines, petroleum wells, and quarries, with one-half of the annual product estimated as amount on hand	781	156·2
Three-fourths of the annual products of agriculture and manufactures, and of the imports of foreign goods, estimated as the average supply on hand	6,160	1,232·0
All real estate exempt from taxation	2,000	400·0
Specie	612	122·4
Miscellaneous, including tools of mechanics	650	130·0
Total	43,642	8,728·4

The book also contains a certain amount of detail as to valuations of property in France, from which I need only extract the following estimates of French property, according to M. de Foville, the recognised authority in France on the subject (*op. cit.* p. 128):

M. DE FOVILLE'S ESTIMATES OF FRENCH PROPERTY.
VALUE IN MILLIONS STERLING.

1878[1]		1886[2]	
Real property, exclusive of houses	4000	Real property, exclusive of houses	3200
Houses, etc.	1000	Houses, etc.	1600
French property abroad	600	French funds and foreign securities	1200
Gold and silver	320	Other movable property	2000
Furniture, personal property, works of art	400		
Agricultural "material"	160		
Farm animals and others	200		
Agricultural "approvisionnement"	200		
Other commercial capital	200		
Other industrial capital	800		
Marine, arsenals, etc.	120		
Total	8000	Total	8000

[1] *Économiste Français*, Jan. 18, 1879. [2] *La France Économique*, p. 442.

Whatever doubts there may be as to the exact figure which ought to be put upon French property, it appears tolerably certain that the figure of 8000 millions which M. de Foville arrives at is not very far from the mark, and if any change has occurred since 1886, it is probably in the direction of an increase of property in houses, in foreign securities, and in other movable property, real property exclusive of houses having probably declined somewhat.

Reference was made above to the use which could be made of the facts as to the amount of property

passing at death in establishing the total amount of property held in a community, provided the proper multiplier of the proportion of people dying to those holding property could be established. This subject has been discussed at very great length by M. de Foville, and an account of his method is given in a paragraph of the book (pp. 130-31) which I propose to quote:

M. de Foville has discussed, with no small ingenuity, a method of ascertaining the amount of property in France from the amounts annually passing by succession, a process to which he has resorted in the absence of income-tax figures corresponding to those which we have for England. The conclusion at which he arrives is that the average annual amount of the successions, *plus* about a fourth for successions *inter vivos*, may be multiplied by 36 so as to show the amount of property held in the country—the assumption being that 1-36th part is succeeded to annually either by death or gift, about 1-45th part by death alone. The speculation is a most interesting one, and is based largely upon data of a kind in the possession of the Ministry of Finance, which are either not in the possession of our own Inland Revenue Department or are not published by them. Mr. Porter, in this country, as I pointed out in my former essay, seemed to arrive at a similar proportion of 1-45th annually passing by death. I should like to see the question followed up more carefully, both in this country and in France. Meanwhile it may be observed that if the proportion can be assumed not to vary for considerable periods, as I think may be the case: there is every antecedent probability, looking at the slow change in the rates of mortality or the customs of people regarding inheritance, that it will not vary greatly; then the growth of property

passing by succession should indicate the growth of property itself. Succession figures are most useful for our discussion. We can compare the rate of growth of property which we arrive at by successive valuations with the rate of growth indicated by the amounts passing at death.

It cannot be said, however, that as yet sufficient evidence has been obtained to establish very satisfactorily what multiplier can be applied. In a stationary country like France, where the population does not progress from year to year, the process may perhaps be more easy than in a country like England, where the population increases rapidly. The point is, however, one to which future statisticians should have their attention directed.

Some particulars are given in the book quoted as to similar valuations in Belgium and Italy, and it may be mentioned also that several of the Australian colonies have given figures as to the amount of property in the community based upon the returns of the death duties. One colony has compared itself with another in respect of capital, according to the figures presented by the valuations for probate duty. I hardly think, however, that the latter discussions have been very informing, the zeal of the colonial statisticians to show a large figure for the colony they represent having, I fear, outrun their discretion in the matter. They have even assumed that the whole population can be taken to possess the same amount of property per head as is possessed by those who die, an assumption obviously unfounded, inasmuch as the living population includes children and others

who do not possess property, and who do not die in the same proportion as those who do possess property. In a book like the present also the object is not so much to give an account of all the facts, as to illustrate the nature of the study and the kind of facts which the student will meet with in the course of his researches.

The facts as to deposits in banks, the funds of insurance companies and the like, which constitute another branch of the statistics of accumulation, need not be exhibited with any detail in this connection. These facts are important in the primary studies to which they relate; and although they are used with reference to this question of the accumulation of capital, they are mainly useful by way of check and comparison, and not because they contain any facts as to the accumulation itself which are at all complete. The method of checking one set of facts by another is, however, most important in all statistics where the facts ascertainable by the principal investigation cannot be established with minute accuracy. In such cases the rough approximation obtainable is fortified by the supplementary comparisons which can be made, although these supplementary comparisons may themselves be most incomplete for the main purpose in view.

CHAPTER XV

JUDICIAL STATISTICS

We pass now to a new department of statistics, considerably different in character from those with which we have hitherto been dealing. This department is that of judicial statistics, including on the one side the statistics of civil proceedings in the Law Courts, and on the other the statistics of criminal proceedings. Hitherto our subject has been that of the statistics of population itself, of the statistics of production and trade in the widest sense by which the population earns its living. Now we have to deal more with the ethical side of human life, although the defence of property and of personal rights, which is one of the functions of the courts, is, of course, closely connected with the business of making a living. This new department of statistics, it may be added, is considered by many statisticians to take precedence in point of importance of almost all other statistics except those of population, including with the latter the statistics of births, marriages, and deaths. In many treatises of statistics it will be found in fact that the judicial statistics, especially

the statistics of crime, come next in order after the population statistics themselves, the reason being that the quality of a population morally is the most important thing to be ascertained about it next after the conditions as to life itself. Having followed a different order myself, I do not altogether agree as to the expediency of this arrangement or as to the relative importance of judicial or criminal statistics in the whole study. It is necessary, however, to recognise the common practice and the grounds of it, as that practice belongs to the study itself. In the important work of Quetelet the study of statistics of crime occupies a considerable place, and the subject is of special interest scientifically, because of the evidence it furnishes that in this department of life, where it might be thought things happen without order, being dependent upon the volition of individuals, there is, nevertheless, a regularity of the most striking kind, the proportion of offences in a population remaining much the same year after year, or changing very slowly; and the number of crimes varying with singular regularity according to the season of the year.

The statistics in this department, including those of crime itself, take the form of records of the business of the courts or of the police, who largely provide the business of the criminal courts, and one of the objects in view is strictly an administrative one. This may not be the most important object in view, or the most important object for which the statistics, when once brought into existence, can be

used, but it is a primary object on the part of every Government, and is really a most important one. It is essential for the Government, which pays the judges and other officers of the courts, and which keeps the courts going, to know what is being done. In early times, as far as civil business was concerned, the courts were self-supporting, to a very large extent at least, and the Government took very little pains about them in a direct way, but this arrangement was an archaic one, belonging to an early type of society, and was not an arrangement which could last in a progressive society. It would always have been better for the community if the Government had attended more closely to the proceedings in the courts, and had not allowed them to be self-supporting; that is to say, had not allowed the judges to make their living by the fees which they obtained for giving services. Now, at any rate, the provision of courts of law for the purpose of settling civil disputes, and for other purposes in connection with personal rights and the administration of property, has become part of the recognised business of every civilised Government, and statistics of the proceedings are required for the purpose of administration. The necessity of such records in connection with criminal proceedings is equally obvious.

Beyond these primary objects statistics of judicial and criminal business are obviously required to throw light on the social and moral condition of a community. Proceedings cannot take place for the enforcement of personal rights and of rights of

property without the general nature of the proceedings reflecting light on the condition of the community out of which they arise. Still more, criminal proceedings clearly indicate the condition of the community as to the disposition of certain classes towards crime, and the statistics of crime have come, in fact, to occupy a special place by themselves, almost irrespective of their position as a part of the general judicial statistics of a community.

To begin with the civil courts, a record of the plaints is clearly adapted to throw light partly on the morality of a community as regards the payment of debts, and partly on the litigiousness of the community. The number of suits that have to be brought, the number where the debt is admitted without defence, the number where there is a defence, and the proportion of cases in which the defence is successful, are all most obvious matters of interest with reference to the condition of a community at a given time, and with reference to changes in that condition over periods of time. There may be great difficulty, as we see, in adapting the statistics to throw light on these matters, owing to the great variety of courts and changes that may be made from time to time in the fees levied before proceedings can begin, and so on. But the object to be arrived at is nevertheless quite clear, and should be kept in mind by the students of such statistics.

There are other suits of a different nature, where the case is not the simple one of a plaint on one side and a defence on the other. A large part of the

business, of English courts of law at least, relates to the administration of estates where, for various reasons, the administration is directly supervised by the court. There are cases in which trustees are allowed to come to the courts beforehand to direct their proceedings so as to avoid the serious liabilities which trustees are subjected to in the management of the property of others. There are also cases where the property of minors has to be looked after, and where in the absence of legally-appointed trustees the court must really either manage itself or appoint persons to do so. The existence of such estates under the direct administration of courts of law becomes a feature of the civil life of a country like England and of all other advanced countries, and the growth or diminution of such a feature becomes a thing deserving of study.

The proceedings of the courts also include the business of giving the right of administering the estates of persons deceased either to the executors nominated in the will or to the persons who are recognised by law as entitled to succeed in the absence of any nomination in a will. In this way the courts of law are able to have a record of the amount of property passing at death, a business which we have already noticed in connection with the subject of taxation. It should be understood, however, that in the absence of taxation there might still be a record of such matters, because the succession to property, from the very nature of the business, comes under the review of the judges as part of the indispensable

legal formalities for transferring to the living the property of the persons dying. The judges might or might not take notice themselves of the amount of property so passing at death, but the number of cases in which they are called on to intervene would always be a matter for record, and in any case it would seem to be desirable that the record should contain some statement as to the amount of property passing, whether or not that statement is required for purposes of taxation.

Proceedings in bankruptcy are also a special kind of procedure not included in the ordinary law court proceedings as between plaintiff and defendant. In bankruptcy, in fact, the law intervenes to prevent the confusion which arises when a debtor is unable to pay all his debts, and when one creditor after another is taking possession of as much of his property as he can get hold of. There is an obvious want of equity in letting those creditors who happen to be the most active, or perhaps who happen to be in the confidence of the debtor, take proceedings first and get all the property. The law, therefore, intervenes to secure an equal division of the property, and hence there are what are called bankruptcy proceedings. Clearly, however, when such proceedings come to be taken they throw light on the general condition of the community in which they arise. The number of bankruptcies and the changes in the number from time to time, the amount of debts involved, the amount of losses accruing to the community in connection with them, are all matters for statistical

record and observation. No doubt it is found in practice that there is great difficulty in getting a complete and continuous record; changes in the law and in the definition of what is bankruptcy, and changes in the severity of the law towards debtors themselves cause very great changes in the number of bankruptcy proceedings taken annually; and there are always cases of real bankruptcy accruing which do not come before the law courts at all. A debtor finding himself in difficulties may succeed in arranging his affairs with his creditors quite privately, and then there is nothing which can come before the law courts. Subject to all these observations, however, the records of bankruptcy proceedings undoubtedly become useful, although the use to be made of them is clearly different, it will be seen, from that which can be made of the ordinary proceedings in the law courts between plaintiff and defendant.

Other special proceedings in the law courts arise in connection with personal rights, such as the proceedings in relation to divorce, and the separation between man and wife. There are also cases in which the courts of law are set in motion, not for the recovery of a specific sum of money but for direct orders from the court to the defendant to do or refrain from doing something which the plaintiff has a right to demand from him. These are all cases, divorce proceedings especially, in which a certain light is thrown by the proceedings in the courts, even on the civil side, on the moral condition of a community. To interpret them may be a work of some diffi-

culty, but the records furnish a basis for study and discussion.

When we come to the criminal side of the work of the law courts we are brought into connection, as already hinted, with the question of the morality of the community: whether crimes are increasing or diminishing; what sort of crimes are so increasing and diminishing, are questions immediately suggested by the study of the statistics of the criminal courts, and they have received great elaboration. The age at which crimes are committed; the time of the year at which they are committed; the question whether they are committed rather by certain special classes of the community than by members of the community taken indifferently, or partly in the one way and partly in the other—are all matters which have been investigated more or less carefully, and which continue to be investigated. As we have remarked already, this branch of the study of statistics has received very great attention, and comparisons are frequently made between different countries or between different parts of the same country, as well as historical comparisons, on these subjects. Two very distinct branches of offences against the law have, however, to be taken notice of in this connection: there are what may be called the great offences, for which serious punishment is provided in the shape of the punishment of death, or punishment by more or less serious terms of imprisonment. These are the offences of murder or of assault upon the person of a serious kind, or of stealing or fraud of different kinds. Besides these, however, there are

innumerable offences of quite a minor kind which are taken notice of mainly in the police courts, offences which are rather disciplinary offences, but are classed as crimes for the general advantage of the community, so as to induce order and better administration in certain ways, but which are not recognised by the community generally as offences of the same nature as those in the first category. The dividing line between the two classes of offences is naturally somewhat difficult to draw at points, but the general nature of the distinction is quite clear. It is mainly, it may be added, with the statistics of more serious offences that what are called the criminal statistics are concerned.

Connected with this subject of the statistics of crime, we have the statistics of what may be called the population of prisons, which become, in fact, the statistics of the criminal population of the country. It becomes quite clear upon an investigation of criminal statistics that a great majority of offences are perpetrated mainly not by members of the community taken at random, but by a special criminal class, and the study of this criminal class can be carried on very largely by a study of that portion of the class which happens to be shut up from time to time within prison walls.

In addition to the statistics of the law courts proper, attention has also to be given in this connection to the records of the police themselves; that is to say, to the question of the number of offences reported to the police and to the question of the records

of the numbers of the criminal population which the police themselves make for their own use, irrespective of the fact whether they are able to bring specific charges against members of that population upon which they can be tried and convicted. There is some vagueness, no doubt, as regards part of such records, and a different amount of attention may be paid to them in different countries, but clearly the study of such records is part of the general business of the study of criminal statistics.

The objects of judicial statistics, therefore, are highly important to every civilised community, and the results obtained must occupy a considerable place in the study of statistics generally. The data, it will be observed, are also for the most part of a satisfactory character up to a point. The actual records themselves being the records of contentious facts made at the time by judges and other persons occupying responsible positions, are in their nature as far as they go extremely good. There can be no doubt about the number of different kinds of proceedings instituted in the civil courts in a year. There is equally little doubt as to the number of persons tried and convicted for serious crime and the punishments inflicted, and so on. Where doubt arises, as already hinted, is in connection with necessary imperfections in the data, however recorded, for the purpose in view. For instance, in bankruptcy the record of the proceedings actually taken in court can easily be made quite complete, but if changes occur in the proportion of cases of real bankruptcy coming into court in

consequence of changes in the law, then there is a difficulty in interpreting the facts as to whether bankruptcy is diminishing or not. The same is the case with such proceedings as those for divorce and for judicial separation, much depending upon what the law is at a given moment and the facilities that may be offered for taking proceedings. The difficulty thus in dealing with judicial statistics is very often one of interpretation, although the records themselves in their origin are extremely good.

A special difficulty arises in the interpretation of our own judicial statistics when any attempt is made to give consolidated figures for the whole of the United Kingdom, owing to the differences which exist in the legal language of different parts of the United Kingdom. The technical terms are all different. In England there are "plaintiffs" and "defendants," where in Scotland there are "pursuers" and "defenders." In England an ordinary proceeding for the recovery of debt is commenced by the issue of a "writ"; in Scotland by a "summons." In England, when the order of the court for payment of the sum demanded is finally given, it is said that "judgment" is entered; in Scotland a "decree" is given. And in England, when further proceedings are taken, the creditor puts in a "distress," or obtains a "garnishee order," where in Scotland he would execute a "poinding" or arrest funds of the debtor in the hands of third parties. In other proceedings there are the like differences. Where a person aggrieved in England by some threatened attack upon his rights would file a

bill for an injunction against the other parties, in Scotland he would petition for an "interdict." In England, where a creditor is afraid of his debtor leaving the country, he would obtain a writ "*ne exeat regno*"; in Scotland he would obtain what is called a "*fugae*" warrant to arrest the debtor. In England, where two or more persons claim the same property in the hands of a neutral who is willing to pay it over to the right party if he knows which it is, the person holding the property is said to be subjected to a "double distress," and can obtain relief by going to the courts and handing over to them the property to deal with; in Scotland the case is said to be one of "multiple poinding," and the holder of the goods brings a "summons of multiple poinding" against the different claimants, also paying the property into court; so that he obtains relief in substantially the same way as a similar debtor in England, but by processes receiving different names. It would be needless to multiply illustrations. It would be quite impossible for any one to consolidate English and Scotch statistics in these matters without an intimate acquaintance with the legal terms in both countries. Still more, the courts in which the proceedings are held are not classified in the same way: in England there is the "High Court" and there are the "County Courts"; and in Scotland there is the "Court of Session" and there are the "Sheriff Courts," and also "Justice of Peace Courts," in which civil proceedings are taken. But the authority of the Court of Session in Scotland is not quite the same as

that of the High Court in England, and the jurisdiction of the Sheriff Courts in Scotland is much more extensive in some directions than the jurisdiction of the County Courts in England. In Scotland also there are still special courts called "Commissary Courts" for dealing with succession to property, whereas in England the subject is dealt with by the High Court and the County Courts. The appeals from the County Courts to the High Court are also not quite of the same nature as the appeals from the Sheriff Courts to the Court of Session. The Justice of Peace Courts in Scotland, for recovery of small debts, are also a kind of supplement to the Sheriff Courts, and perform to some extent the work which is done by the County Courts in England.

There are similar differences in the legal language and proceedings in Ireland. There is more resemblance in one way between English and Irish proceedings and between English and Irish courts than there is between English proceedings and courts and Scotch proceedings and courts. But I have found at different times, in trying to compare the statistics of England and Ireland, that want of acquaintance with Irish technical terms makes great difficulty in consolidating the judicial statistics of England and Ireland. As a matter of fact also there is no statistical department in the United Kingdom charged with the duty of consolidating the statistics of the three countries in this matter; and for all practical purposes it may be said that there are no judicial statistics of the United Kingdom, although some

attempts have been made, mainly by private persons, to consolidate some of the principal parts of the criminal statistics.

Going further afield, it need hardly be said that similar difficulties are encountered in making comparisons between different countries as regards their judicial statistics. The proceedings and the courts being different and the classifications being different, comparisons can only be made with extreme difficulty and care. Criminal statistics seem more easy of comparison than others, especially the statistics of serious crime, but the inherent difficulties of comparison, owing to the differences of legal language and procedure, always remain serious.

We may now give one or two illustrations of the sort of facts which are obtainable by means of judicial statistics. To begin with the civil statistics, we find that the total amount recovered on verdict or judgment in actions in the High Court, Queen's Bench Division, in 1896 was £540,000, of which some £121,000 was contributed by actions respecting goods sold and delivered, money paid, lent, etc., promissory notes, and bills of exchange. Of 1,119,420 plaints entered in County Courts, 1,105,981 were for amounts not exceeding £20, only 1220 for amounts exceeding £50, the average amount per plaint being just under £3. It will not fail to be observed that in an economic sense these proceedings have not much direct importance. All the apparatus of the courts, as far as they are concerned, is in existence to enable creditors to recover what are really very small sums

in comparison with the general business of the country, and to settle disputes which are for the most part of a trumpery nature. It will also be observed that the proceedings apparently affect mainly the poorer classes of the community. The number of cases in the County Courts for small amounts appears to be out of all proportion to the cases where disputes may be supposed to exist among the wealthier classes of the community. It does not follow from such considerations that law courts are not required in order to enable creditors to recover their money from debtors. Indirectly the utility of law courts may be even greater than their direct use, because debts may be more readily paid through debtors knowing that proceedings can be taken. What the figures really show is that the existence and use of the law courts are to be defended, not by the extent of the proceedings actually taken, but by other considerations.

It may be noticed, moreover, that the amount of property in the custody of the courts is really very considerable. According to the latest return, it would appear that the courts had then in their possession and administered a fund of nearly 60 millions sterling in the case of England, and nearly 100 millions in all.

The number of different suits or cases in which this property is held cannot be so distinctly stated, while it would be still more difficult to enumerate the number of persons interested in these funds. The amount of the funds is, however, so large as to show that their existence is an element of interest in the

social life of the community. It might be desirable to have the subject investigated fully for the sake of the information that would thus be acquired.

With regard to bankruptcy, there are now comparatively full statistics in this country since the passage of the Bankruptcy Act of 1883. But it is practically impossible to consolidate them all so as to show in a line the amount of bankruptcy or insolvency in a given period. In England it appears that the number of adjudicated bankrupts, including liquidation by arrangement and composition with creditors, was 4098 in 1897, and these were the proceedings in court. In the same year, however, there were 3208 cases of assignments, compositions, etc. registered under the Deeds of Arrangement Act of 1887. The total cases would thus be over 7000 with which the officials who compile the statistics were acquainted. But cases would not be included where practically compositions had been agreed to between debtors and creditors without the formalities of the Deeds of Arrangement Act or administration orders made by County Courts where the total indebtedness of the debtor did not exceed £50. The amount of the liabilities in the cases stated was, in 1897, £5,772,000 for cases in court, and £3,981,000 for cases out of court, and the assets were respectively £2,803,000 and £1,910,000, the assets, however, according to the statements of the official authorities in the matter, being merely estimated, and the actual loss to the creditors being probably much greater than the nominal difference between liabilities and

assets. These are the statistics for England alone, and they do not include the number of orders made for winding up companies in England, which amounted in 1897 to 108, with liabilities of £836,000, as estimated by those companies where a statement of affairs had been lodged. It appears from the returns that a great decrease has taken place since 1883 in the number of cases of bankruptcy and the liabilities, but there are great fluctuations in the matter, and it would be unsafe probably to draw any certain conclusion that bankruptcy and insolvency are declining.

In Scotland, in 1897, the number of bankruptcies was 278, and here also bankruptcy would appear to have been declining in recent years. There is no mention, however, in the official statistics of any private arrangements with creditors. In Ireland the figures are on a somewhat different basis, and it would appear that there are no later figures than 1887, so that it is of doubtful utility to quote them. In 1887, as far as one can judge, the number of cases was much the same as the number of cases in Scotland at that time, but the liabilities were quite insignificant.

The bankruptcy statistics accordingly give some idea that the amount of bankruptcy in the country, as far as the official figures enable one to judge, is not at the present time very extensive. As already said, however, there are naturally great fluctuations in such a thing as bankruptcy, while it is possible that the number of cases recorded may have fallen off owing to the severity of the administration, which prevents

debtors coming into court, while the creditors are equally prevented from taking them into court by finding that owing to the want of assets it is not worth their while to do so. In order to form any trustworthy conclusions a special study and criticism of the figures will clearly be required.

There are similar figures as to bankruptcy in other countries, and they are supplemented also—particularly in the United States—by unofficial records of failures. It would be useless, however, in a work like the present, to give further details, especially as no conclusions could be stated without an extensive study of the subject and criticism of the figures. The points which the student must keep in mind are the difficulty of forming any conclusions from official figures alone, unless they can be connected with an exact account of the law at a given moment, and the further difficulty that actual insolvency may at one time appear to a larger extent in the official returns than it does at another time.

With regard to criminal statistics, the first point to notice appears to be the number of criminal offenders committed for trial, convicted and acquitted in cases of serious crime, according to the distinction above drawn. The most general figures which we can obtain in this way for the United Kingdom are as follows :

[TABLE

COMMITTALS AND CONVICTIONS FOR SERIOUS CRIME IN ENGLAND, SCOTLAND, AND IRELAND IN 1897.

	Committals.	Convictions.	Proportion of convictions to committals per cent.
England and Wales .	11,342	8,992	79·3
Scotland . . .	2,203	1,796	81·5
Ireland	1,885	1,242	65·8
Total . .	15,430	12,030	78·0

It will not fail to be observed from this table that there is a very appreciable difference between the committal for trial and conviction, from one-fifth to one-third of those who were committed escaping conviction. The real difficulty in using such a figure, however, is that the fact to be arrived at is the difference between the number first accused and the number finally convicted, and this figure we do not get in the above statistics, which only show the number definitely accused and committed for trial after the investigation before the magistrate. Still more, there is no comparison here between the number of crimes committed, including those where no person has ever been accused before the courts, and the convictions. It would further appear from the table in the *Statistical Abstract* for the United Kingdom (1898), p. 261, from which the above figures are taken, that there has been a steady decrease in crime for many years if we are to take the number of convictions for serious crime as the test. This is shown by the following table :

NUMBER OF CRIMINAL OFFENDERS CONVICTED IN ENGLAND, SCOTLAND, AND IRELAND RESPECTIVELY, AND IN THE UNITED KINGDOM IN THE UNDERMENTIONED YEARS.

	England.	Scotland.	Ireland.	United Kingdom.
1883	11,347	1916	1740	15,003
1884	11,134	2085	1546	14,765
1885	10,500	1956	1573	14,029
1886	10,686	1838	1619	14,143
1887	10,338	1843	1411	13,592
1888	10,561	1853	1220	13,634
1889	9,348	1737	1225	12,310
1890	9,242	1825	1193	12,260
1891	9,055	1823	1255	12,133
1892	9,607	1778	1196	12,581
1893	9,797	1903	1378	13,078
1894	9,634	1937	1469	13,040
1895	9,169	1652	1096	11,917
1896	8,856	1704	1310	11,870
1897	8,991	1796	1242	12,029

It must not, however, be concluded with too great certainty that there has been a serious reduction of crime, to the extent that such figures would indicate, without much further investigation. It is evident from the notes to the table from which we have taken the figures that some changes in the law have taken place in the interval, while all such figures are liable to the consideration that committals for trial themselves are dependent to some extent on the discretion of the magistrate, and that committals may have diminished on account of the growing disposition of the magistrates to deal summarily with cases of offenders coming before them.

Apart from the reduction which the figures show,

they contain an indication of the tendency of crime to increase in years of depression and adversity, a fact which has been noticed in criminal statistics for a great many generations. Thus in England we find that in 1891 the figure of convictions got as low as 9055, but in the following year there was an increase to 9607, and in 1893 to 9797, the figure for 1894 being also very large. This corresponds fairly with the changes in the condition of trade in the interval. 1890 was a year of great prosperity, and the conditions continued into the following year, notwithstanding the collapse of Messrs. Barings towards the close of 1890. In 1892–93 and 1894, however, the effects of the Baring collapse were felt; there was a good deal of trade depression, and it is in accordance with this change apparently that the figures of conviction for serious crime increased. There is a similar change, it will be observed, in Scotland and Ireland, the increase in Scotland, however, being confined to the years 1893 and 1894, and in Ireland to the same years. The connection between trade depression and serious crime is not to be proved by a single case like this, and I am only drawing attention to it because it is one of the recognised results which have been established by the statistics of crime in this country and in others for several generations.

As already observed, a connection appears to exist between the amount of crime committed and the different seasons of the year, the age and sex of the criminals, and the conditions of business, which has just been adverted to. I do not propose, how-

ever, to give illustrations in detail upon these heads, partly for the reason that they already occupy a considerable place in the literature of the subject, and also because, as far as I can judge, the learning on this head appears to be to some extent more curious than useful. It is a conclusion, for instance, from the common facts of life that certain crimes are more likely to be committed in the summer season in northern Europe than in other seasons, because they are crimes which in their nature must be committed out of doors, and there is more out-of-door life in the summer season than in other seasons. The elaboration of such facts which may be possible statistically can hardly be said to give anything but curious information to those interested. With regard to the age of criminals again, it is natural to find that crimes are committed, as a rule, by people in the prime of life, just as any other industry is carried on by people at that time of life. There is more interest, perhaps, in the extent of juvenile crime, indicating the existence of a criminal population, but the elaboration of statistics cannot tell us much when once the fact of a criminal population is accepted and understood. With such a population there is, of course, juvenile crime, just as with the working population the children and young people have to contribute to the work of earning a living. With regard to sex, again, it is natural that in crime, as in other industries, the work should be carried on mainly by the stronger sex and not by both. General figures as to the proportion of the sexes

in the committals for trial of serious crime are as follows in the United Kingdom:

MALES AND FEMALES COMMITTED FOR TRIAL IN THE UNITED KINGDOM IN 1897.

	Males.	Females.	Total.	Proportion of males to total per cent.
England . .	9,930	1,411	11,342	87·6
Scotland . .	1,866	337	2,203	84·7
Ireland . . .	1,609	276	1,885	85·4
Total . .	13,405	2,024	15,430	86·9

The proportion of crime committed by males thus appears to be from five-sixths to seven-eighths. In England the proportion is about seven-eighths; in Scotland it is about five-sixths; and in Ireland it is about six-sevenths. Of course this is the proportion for all crimes, but it is obvious that it is much in excess of the proportion of male to female labour in the aggregate of the industries of the country, while, on account of the mass of crime which is not connected with property or with the pursuit of an unlawful occupation in order to earn a living, it might have been expected that, if women were predisposed to crime like men, the proportion of crime committed by women ought to be larger than the proportion of women to men in the ordinary industries of the country. It would hardly be expedient, however, I think, to elaborate the matter or to discuss all the reasons why there appears to be a greater tendency to crime among men than among

women. To some extent, also, it has to be considered that a woman supported by the proceeds of crime and living with the men who go out and commit the crimes, is really to all intents and purposes a member of the criminal classes, although she does not become subject herself to the processes of the criminal courts. The subject is one which would require a great deal of elaboration, and all that can be done here is to indicate the point and its curious rather than its useful character.

Not to pass over altogether the subject of minor crimes, I have extracted from the judicial statistics for last year a few figures showing the facts of this head :

ENGLAND AND WALES. COURTS OF SUMMARY JURISDICTION. NUMBER OF PERSONS TRIED FOR NON-INDICTABLE OFFENCES, 1883–97.

1883	651,695
1884	648,908
1885	613,199
1886	571,996
1887	594,903
1888	598,449
1889	616,189
1890	667,807
1891	663,158
1892	640,603
1893	604,310
1894	634,330
1895	628,200
1896	669,732
1897	698,980

The apparent inference from this table would be that, although the division of what is called serious crime has been fairly steadily decreasing, yet the criminality of the population as a whole cannot

be said to have been diminishing during the past few years. This inference has, in fact been drawn, and is frequently drawn. It is urged that the factor to be considered is that of offence against the laws, and even if the returns of offences are increased by something new being made an offence, yet the thing the public is concerned with is the fact of indisposition to obey the law which the committal of the offence reveals. This is a question obviously to which people's common sense should be applied, and it seems quite evident that on this point we must side with those who consider serious crime to be a very different thing from law-created disciplinary offences. Thus in a municipality it may be a very bad thing for the citizens to have chimneys on fire, and those citizens who have their chimneys on fire ought properly to be punished, but the offence is visibly not of the same nature as the offence of an assault or burglary or robbery, and is more an indication of carelessness and laxity in making household arrangements than of positive criminality of any sort or kind.

Inferences may properly enough be drawn from the fact of the extent of such disciplinary offences, as we may call them; but they seem hardly to belong to the question of criminality at all, as properly understood. Some of the offences of a minor kind are perhaps properly enough included in the criminal statistics, but those who make up the records should not mix up such offences with all the various offences included among minor crimes, while to make the

distinction effectually would be most laborious and unprofitable work.

Another reason for not setting too much importance on these records of what we may call disciplinary offences, is that to a large extent they are matters for police organisation. The number of cases is especially apt to rise and fall in accordance with a rise and fall in the vigilance of the police. In enforcing, for instance, the Acts for preventing the adulteration of food the police have great discretion in making or not making offences; they may become very busy at a given moment, going about and purchasing samples, and having them analysed, so that more cases are brought into court than would be the case at a time when the police were less vigilant. After a time also it may be found the vigilance of the police is rewarded, and that there are actually fewer cases because the people are more careful, the disciplinary Acts being thus made effective for their purpose. The lesson to be drawn from such facts, however, would be a lesson as to the method of procuring certain amendments of conduct in a given population, and not a lesson as to the extent of crime or criminality in that population. A still more striking illustration can be given from the statistics relating to drunkenness and disorderly conduct, which are found in these criminal statistics, and about which there has been an endless discussion on account of the great social and political interest of the subject. Attempts have been made to compare different populations in a

given country as regards the extent of drunkenness prevailing amongst them, from the returns of cases of sentences for being drunk and disorderly, and comparisons have also been attempted between populations at different times to illustrate the question as to whether there is improvement or not, and as to the effect of particular legislation. I do not propose to enter minutely into such discussions. It is quite obvious to any one who gives the least consideration to the subject that the greatest variations may arise from the differences in the vigilance of police at different times in making cases of drunkenness. If the police are encouraged to make cases in one place or at one time, and not in other places and at other times, then more cases will be found where such encouragement is given than where it is not given. Still more, the cases of drunkenness, and disorderly conduct arising from drunkenness, which come under the notice of the police are not a sure indication by any means of the extent of drunkenness in a given class of the community or in the whole community. One class which is not able to consume alcohol in its homes or in its clubs, free from observation, may have a greater proportionate record of police cases of drunkenness against it than another class which is rich enough to consume alcohol in its own homes or clubs or hotels, where practically drunkenness can take place without the police having notice of the cases. The result is, not that statistics are altogether useless in throwing light upon the question of the drunkenness or the

reverse of a given population, but that they require to be treated with a degree of care which is probably impossible upon any subject where public feeling is much excited.

Criminal statistics proper are supplemented by statistics as to what may be called the population of prisons. I believe that if the question of prison population were properly handled and a careful account given at different dates of the different classes of people contained in the prisons, the length of their sentences, and the different crimes for which they have been committed, conclusions would become possible as to the nature and extent of the criminal population in the whole community, to which the prison population would be a kind of index number. In making such an account, however, the utmost care would have to be taken to classify the population, to distinguish between those who are in prison, not merely because they have been condemned to prison, but because from want of means they have been unable to pay the fines which they had the alternative of paying, and others who are in prison because the sentence itself did not give them any alternative. I do not know that the question of prison population has been adequately dealt with from this point of view, and nothing more can be done than to select certain classes of prisons for treatment on the assumption that, broadly speaking, they include the criminal population of a certain class.

The question of comparative judicial statistics has already been referred to as being theoretically one of

unusual difficulty. Attempts are often made, however, to compare different countries and communities according to their supposed criminality. Some of our colonial dependencies especially are very fond of such statistics, as they imagine them to prove the superiority of the colonies in many ways to the mother country and to other older countries. It is obvious, however, that no general statements can be made on points like these, and that it is hardly wise even to bring together for purposes of comparison the nominal figures which are obtainable, just because no inferences founded upon them can be worth anything without a great deal of study, not merely of the statistics, but of the whole facts and conditions relating to them in each of the different countries.

CHAPTER XVI

PAUPERISM

By a natural transition we pass from the statistics of crime to those of pauperism. Although in one respect the consideration of pauperism belongs to economics, the question being that of the poverty of those who are called paupers, and require to be supported by the rest of the community, yet in another respect the point of view is that we are dealing socially with an inferior part of the population, just as in respect of crime we are also dealing with an inferior part of the population. In fact to a very large extent it has to be recognised that the criminal classes are also the poorer classes. There are paupers who are not criminals, and there are criminals who do not become paupers, but as a matter of fact it is found that criminals drift into the workhouses towards the close of their lives, and that the workhouses in this respect may be considered to be refuges of the criminal classes. In both cases, therefore, we have to do with the wreckage of the population, although in the case of pauperism the nature of the social wreck is more extensive

and is not quite the same as in the case of the criminal classes.

The main statistics we have to deal with relate to what is legally pauperism. This has come to be a phrase of very strict definition in England. According to law, ever since the time of Elizabeth, persons who are destitute are entitled to be supported by the rest of the community, and guardians of the poor are elected in each parish, upon whom a legal obligation rests to support the destitute when application is made to them. In time, therefore, there has come to be established a class of people who are entitled to poor relief, as it is called, and the statistics of pauperism consequently relate to the administration of this relief. We have accordingly in these statistics a very definite subject to deal with. It will be understood, however, that the legal pauperism does not include everything in the nature of pauperism, especially in its economic aspect. Economically we have the same fact to deal with in all those various charities which are established for the purpose of giving relief to different classes of poor people. This point is specially important when comparisons are made between England and other countries, because in almost all old and civilised countries the same condition of poverty has to be dealt with that is dealt with in England by the English Poor Law; and yet there are no exact statistics of an analogous nature in foreign countries. Complete comparisons between one country and another become thus extremely difficult, while it would be almost impossible

in England to bring together the different facts relating to charities for the poor, and correlate them with the statistics of legal pauperism.

Confining ourselves for the present, however, to the subject of legal pauperism, we have to notice that in spite of the limitations of this legal pauperism the statistics relating to it may nevertheless be useful in throwing light upon the economic condition of the country as regards extreme poverty. The legal pauperism may, in fact, become an index number of the real poverty in the country, and the increase or decrease of it may be a fairly good indication of the increase or decrease of the amount of the social wreckage itself, although it may be very difficult to define the wreckage and give an exact statement of its quantity. Various questions, it will be seen, also arise out of the study of legal pauperism which require to be noticed on account of the public interest which has been taken in the subject, and the amount of attention bestowed upon them by the Government and the Legislature.

The general object of the statistics is plain enough: the Government having to support the destitute desires to know the numbers whom it supports, and the cost of the support under different headings. These are the main things which are to be accomplished by the statistics of pauperism. Further, the Government desires a classification of the pauperism. Clearly some classification according to sex, according to age, and further according to the ability of the persons relieved in regard to power of

work, are things which it is desirable for the State to know in connection with those whom it relieves. Other distinctions have arisen in the course of the administration, such, for instance, as the number of vagrants and others relieved casually as distinguished from those who are more or less in receipt of permanent relief. Altogether pauperism is one of those subjects which can be most usefully studied with statistical help for the purposes of the daily administration of the Government. The data in possession of the Government are also in themselves very good. The subject being one of administration, the records of the administration itself contain the data which are to be made use of in the statistics, and there could not be a better foundation if the statistics themselves are properly developed. Difficulties which arise are those inherent in the classification and in the nature of the division between what is legal pauperism and what is really pauperism in the wider sense of the word, as to which in large part no official statistics are available.

At the very outset there is to be noticed an inherent difficulty of a serious character in stating the number of paupers. The numbers are not the same week by week or month by month or year by year, and, what is more, the individual persons are not the same. People who are paupers in the month of January or February are not paupers in the month of March or April. Some go off and others come on to the lists, so that there is a considerable change from one date to another. The question then

arises, how is the amount of pauperism to be stated? A census on a given day in the year or on three or four days in the year, of which a mean is taken, will no doubt give a certain figure, which will be useful for purposes of comparison from one year to another, but it will clearly not be the same thing as a statement of the number of people in the community who have in point of fact received relief in the course of a given year, or who have received relief at any period in their lives. The latter figure especially may be one that is difficult to arrive at, and the figure of the total number of persons in the community who have received relief in a given year may also be difficult to arrive at; but whatever the difficulty may be it ought to be recognised that the figure obtainable by means of a census on two or more days of the year is not really a statement of the total number of paupers, although it may be a statement of the number throughout the year reduced, as it were, to a common denominator, so that it becomes a statement which can be used for purposes of comparison.

In the statistics of pauperism in this country, it may be stated, the figures for the number of paupers which are used are exceedingly various. In many tables the actual figures on particular days are used, in others the figure is that of the mean upon certain days of the year. There is a slight variation in the numbers from winter to summer, and even from month to month and week to week; but for long comparisons it would matter little which figure is taken, provided it relates to the corresponding date or

is the corresponding mean for each year. It has been found convenient for purposes of comparison and otherwise that such figures should be used, and I am not objecting in any way to their being so used. We must be careful, however, to understand what the figures mean, and there can be no pretence for saying that the number of paupers, as thus stated in the returns, is the same thing as the number of persons who have actually received relief in the year, or who have actually received relief at any time of their lives. From a special return which was made for 1891–92 it would seem that the actual number of persons receiving relief at some time or other in a given year, is $2\frac{1}{4}$ times the amount of pauperism ascertained by the one day count, but this is still defective in not giving any notion of the number of persons who may receive very partial relief indeed, and who are in fact only occasionally pauperised and not chronically or regularly in such a condition as to entitle them to poor relief.

The number of paupers in the United Kingdom on some one day in January 1898, given in the *Statistical Abstract* for the United Kingdom before me, is as follows:

England and Wales . .	823,000
Scotland	101,000
Ireland	100,000
Total .	1,024,000

This compares with the total population in the United Kingdom of 40 millions, in round numbers, so that the permanent pauperism stated in this manner may be considered to be 1 in 40 of the population.

It should be added that the total is a very rough one, as the returns do not relate to the same date in England, Scotland, and Ireland, nor have the figures quite the same meaning (see below). It is always to be remembered, further, that this is the figure of the legal pauperism, and is not the total number of the very poor in the economic sense, and that even as regards the legal pauperism it does not show the total numbers who have been at any time relieved during the year, or the total numbers in the community who have received poor relief at any time during their lives.

To show the difficulty of the definitions also it may be pointed out that although the figures are probably in substance the same in each portion of the United Kingdom, yet they are not defined in precisely the same manner. In England there is a distinction between adult able-bodied and all other paupers, while the number of vagrants, amounting to about 13,500 in January 1898, is also omitted. In Scotland the figures given include the vagrants, who are, however, very few in number, while there is no distinction between adult able-bodied and others, but there is a distinction between those who are called paupers and those who are dependents upon them. In Ireland again, the distinctions are between out-door and in-door paupers, and the distinction between able-bodied and other paupers applies only to the in-door pauperism. The numbers in Ireland also include specifically the numbers in blind and deaf and dumb asylums and extern hospitals separately

stated, whereas in England and Scotland any such classes of poor persons are no doubt included under the other headings.

The amount of pauperism thus stated is, moreover, the amount on one day in the year, which gives nearly the maximum figure, and not even the mean of two or more days. A statement of the total numbers in the summer preceding the above figures for January 1898, would have been as follows:

England and Wales . .	782,000
Scotland	98,000
Ireland	96,000
Total . .	976,000

Thus the difference between summer and winter amounts to about $4\frac{1}{2}$ per cent of the total. For comparative purposes either figure would probably suffice, but confusion must not be made between the two figures. Probably the most satisfactory for comparative purposes would be a mean of the two figures, but it would hardly be necessary to take the trouble to strike the mean if one were careful in a comparison of different years always to take the maximum or the minimum.

Using the figures as a kind of index number it becomes obvious at a glance that pauperism for a good many years has not been an increasing factor in the United Kingdom, allowing for the increase of population. The figures in the *Statistical Abstract* from which I am quoting go back to 1883, and in January 1883, the total number of paupers in England was 799,000, compared with 823,000 in

January 1898. The lowest figure in any intermediate year, which appears to have been 1892, was 754,000, while in several intermediate years a higher figure than for 1883 was reached, *e.g.* January 1888, the figure of 825,000, and in January 1896, the figure of 827,000, while at most of the dates the figure was either over 800,000 or comparatively little below. In other words, then, allowing for the increase of population, pauperism has been rather diminishing than increasing in England in the time stated. When we go back for a further period, the decrease appears to be even more remarkable. Whereas now the total in the United Kingdom comes out as about 1 in 40 of the population, or about $2\frac{1}{2}$ per cent, we find that in the early part of the century and down to 1850 the figure was 4 per cent and upwards. The change is subject to the observation, of course, that the reduction may be partly due to the increase of outside charity, which prevents the destitute coming upon the poor rates for relief. But the indication of the figures undoubtedly is that the prosperity of the country has been increasing, and that there are fewer of the very poor. Considering what legal relief is, an improvement would in any case be indicated by the fact that outside charity is providing more fully for the relief of the very poor than was formerly the case.

Without going into any details it may be stated that the facts as to Scotland are very much the same as those for England, the number of paupers being comparatively stationary alongside of increasing population. In Ireland the indications are not quite

so easy to follow. Here a decrease of the pauperism is shown from about 116,000 in 1883 to 100,000 in 1898, but this decrease has gone along with a decrease of the population, so that it cannot be said that there is any improvement in the condition of the people as to pauperism.

The next question dealt with in official statistics is the actual expenditure on the relief of the poor. A curious fact here becomes apparent: the expenditure in relief of the poor has been constantly increasing for many years in England and Scotland, although the number of poor has been stationary, as we have seen; while the expenditure in Ireland has rather diminished; yet if the same process had been going on as has been going on in England and Scotland, there would have been no diminution of expenditure, in spite of the diminution in the amount of pauperism itself. In England the increase in the expenditure is from £8,353,000 in 1883 to £10,432,000 in 1897, or, in round figures, 25 per cent. In Scotland the increase is from £872,000 to £1,058,000, which is, in round figures, an increase of 20 per cent. In Ireland the decrease is from £1,146,000 to £1,050,000, or about 8 per cent, the decrease in the numbers amounting to about 15 per cent. If expenditure had grown in Ireland as it has done in England and Scotland, there should have been an increase of about 10 per cent in the expenditure, notwithstanding the diminution of 15 per cent in the numbers. Into the causes of this steady growth of expenditure in England and Scotland, without any such growth in Ireland, it would be

foreign to our purpose here to inquire. The figures, however, are obviously useful to those concerned with the administration as drawing attention to the effects of policy, adopted and carried out with more or less logical completeness. In part, it is believed, the increase is due to the general advance in the welfare of the people, which compels an increase of salaries and all establishment charges in connection with the administration; and it is also due in part to a raising of the standard of living throughout the country, which compels greater attention to the care and comfort of the poor who are the subject of relief. The increase of expenditure, it may be noted, is also the more remarkable on the latter head on account of the decrease in the cost of food itself, which has been going on in the interval.

The increase of expenditure, it may be noticed, is also the more remarkable if we go back to a time when the numbers of the poor were greater than they are now. Taking England alone, we are able to obtain the following comparison:

Expenditure on Poor Relief in England and Wales at the following Dates compared.

Year ending Lady-day.	Mean number of paupers (thousands).	Total expended for poor relief (thousands of £'s).	Amount expended per head of population.
			s. *d.*
1850	1009	5,395	6 1¾
1860	845	5,455	5 6½
1870	1033	7,644	6 10½
1880	808	8,015	6 3¾
1890	775	8,434	5 11¼
1897	815	10,432	6 9½

The change is altogether most remarkable, whatever may be the exact explanation. The satisfaction which may be felt at the decrease of pauperism itself is somewhat modified by the consideration that the burden, as far as total expenditure is concerned, has been for so long a time going on increasing. In connection with the other facts which we have adverted to in connection with financial statistics as to the growth of local expenditure itself, we have here apparently a final proof that the question of finance which has been for a long time allowed to slip, may again require to be taken in hand very stringently.

Another point of view from which the statistics may be examined is that of the relative proportion of men, women, and children among the paupers, as compared with the relative proportion of men, women, and children in the ordinary population. There seems to be little doubt that among paupers women and children predominate; that is, they are in larger proportion than they are in the ordinary population. The reason, no doubt, is that they are less self-supporting than adult males, and many adult males are probably able just to support themselves when they have no dependents. Whatever may be the exact explanation, the facts themselves may be stated, and the following specimen of what the facts are for England may be enough for the present purposes:

[TABLE

NUMBER OF MEN, WOMEN, AND CHILDREN RECEIVING POOR RELIEF IN ENGLAND ON 1ST JANUARY 1898.

Men, able-bodied	34,803
Men, not able-bodied	150,050
Women, able-bodied	72,268
Women, not able-bodied	250,219
Children, under 16	225,652
Vagrants	13,563
Insane	90,540
Total	837,095

The dividing age between the children and adults is, as stated, sixteen, and it would seem quite clear that the children, amounting to nearly one-third of the total, are in excessive proportion as compared with children in the ordinary population. Women, whose numbers only slightly exceed those of men in the ordinary population, are here in much larger proportion. The distinction between able-bodied and not able-bodied is itself very interesting, as showing incidentally that the people who are the objects of poor relief are the weaker parts of the population,—the old and infirm and the very young, whose misfortune is that they have no able-bodied workers to support them. But those who are able-bodied themselves, if they are not all able to take their share in supporting dependents, are at least able to earn enough to keep them from being recipients of poor relief. In the returns also the able-bodied include those who are usually able-bodied, but who happen at the moment to be disabled from disease or accident.

Looking back for some time we find that the proportions above stated change very little, so that

they may be taken to indicate the permanent features of pauperism in this country, though of course these features, when long periods are brought under review, may be subject to alteration.

Another point of view from which the returns of pauperism have been examined is that of the aged in the ordinary population. This is really much the same point of view as that according to which the relative proportions of men, women, and children are ascertained. It is only a further development of the latter point of view that information is desired respecting the precise age of the different members of the pauper community. It does not appear that in the ordinary statistics of pauperism attention is given to this question of age, but a special return was obtained for 1891–92, showing the ages of paupers relieved on 1st January 1892 or at any time during the preceding year, and from this a great many deductions have been made as to the preponderance of very old people amongst paupers as compared with the relative numbers of old people in the general community. In particular, it has been pointed out that whereas the proportion of paupers to the whole community, as we have seen, is about 1 in 40 on the one day count, the proportion of paupers over the age of 65 to the total number of persons over that age is something like 1 in 5, and these proportions are further raised when the year's count is taken. Here again, without making any comments, but simply to show what the statistics tell us, we may

give the following summary of the special return referred to :

Age.	Numbers relieved. (Thousands.)		Proportion of numbers relieved per thousand of population between same ages.	
	Jan. 1, 1892.	1891–92.	Jan. 1, 1892.	1891–92.
Under 16 . .	229	554	21	51
16 and under 65	203	618	12	37
65 and upwards	268	402	195	293
Total .	701	1574	24	54

This return, and the deductions drawn from it, it may be observed, are to a large extent the foundation of the case for a Government scheme of old age pensions, which has attracted so much notice during the last few years. The hardship of letting old people, who have fought the battle of life and kept themselves from receiving poor relief during their working life, die as paupers, is naturally the subject of a good deal of sympathetic comment. The odium of pauperism is such, that at almost any cost it is desired to prevent such a calamity happening to the old. The remark, however, seems justified that to some extent the numbers of old people receiving poor relief arise from the circumstance that old age also means infirmity and disease, and considerable numbers are really inmates of workhouse infirmaries, which are substantially the same thing as general hospitals, though the latter are endowed largely by spontaneous

contributions from the public, and are not paid out of rates. So far as the economics are concerned, old people who are suffering from disease must in some way or other be supported and nursed by the rest of the community, and it is a matter of detail upon which nothing turns whether they are supported by old age pensions, or in hospitals at the expense of voluntary contributions, or in workhouse infirmaries at the expense of the rates. Socially there are, no doubt, important reasons why it is desirable that all classes of the community should be supported out of resources of their own; but it may be doubted whether there is much to choose economically between giving the support in the form of old age pensions or treatment in hospitals or treatment in workhouse infirmaries, so long as the treatment is not paid for out of resources which the people themselves have accumulated in their times of prosperity. It would be undesirable, here, however, to enter into all the pros and cons of old age pensions, especially now when it has become a political question.

Another point of view from which the returns have been examined is a very interesting one, viz. that of the locality of pauperism itself. It is found that when one district of the country is compared with another, the proportion of the number of paupers to the whole population, and the proportion of the cost of pauperism to the population, varies very considerably. Besides the variations from one small district to another, which are often very startling, there are variations in very considerable districts indeed which

appear to be well worth notice. The Local Government Board in England, in its account of pauperism in a tabular form, divides the country into eleven districts, and from the figures which it gives I extract the following particulars as to the proportion of pauperism in each district, which tells their own tale:

STATEMENT OF THE AMOUNT OF PAUPERISM IN THE UNDERMENTIONED DISTRICTS OF ENGLAND AND WALES, SHOWING THE PROPORTION OF THE NUMBER OF PAUPERS ON 1ST JANUARY 1898 TO THE POPULATION IN EACH DISTRICT, AND THE AVERAGE RATE PER HEAD OF THE EXPENDITURE FOR POOR RELIEF IN THE SAME DISTRICTS IN 1897–98:

District.	Proportion of paupers per 1000 of estimated population.	Rate per head of expenditure for poor relief.	
		s.	*d.*
South-Western	39·5	7	$0\frac{1}{4}$
Eastern	35·2	6	9
Welsh	32·3	5	9
West Midland	28·4	5	$8\frac{1}{4}$
North Midland	28·3	5	$9\frac{1}{4}$
South Midland	28·2	6	$1\frac{1}{2}$
London	27·6	14	$0\frac{3}{4}$
South-Eastern	27·2	6	$7\frac{3}{4}$
Northern	22·2	4	$4\frac{1}{4}$
York	21·1	4	$7\frac{3}{4}$
North-Western	20·4	4	$7\frac{1}{4}$
England and Wales	26·9	6	$9\frac{1}{2}$

The deduction from the figures is that pauperism is to a large extent an affair of geography and of ancient settlement. It is evidently much higher in the east and south of England than it is in the northern and western counties. A line drawn from the Humber southwards and then westwards from

about the neighbourhood of London, will leave on the eastern and southern side those districts of England where pauperism is highest, while in the rest of England to the west, and also to the north of the Humber, the proportion of pauperism is less. It is that part of the country to the east and south which constitutes the historical England, while to the west and north the population is newer and is also freer from the taint of pauperism. The explanation seems to be the same as may be given for the comparative absence of pauperism in our colonies, which has frequently been noticed. The migration of people which leads to settlement in new and previously unoccupied parts of a country, is the migration of strong and active members of the community, and the whole burden of pauperism is left in the older and settled portions of the country. To some extent, however, it may be feared that the hereditary pauperism of England is directly due to the mischievous legislation of the time of Queen Elizabeth, which directly pauperised the peasant community of England.

Before leaving these illustrations of pauperism statistics, we may also notice special discussions which have arisen as to one great point in the administration of the Poor Laws during the last half century. It is contended by Poor Law reformers that one reason of the diminution of pauperism in that period has been the increasing application of what is called the "Workhouse Test" to the candidates for poor relief. To give poor relief to persons who are allowed to remain at their own homes and may use the relief

obtained to supplement small earnings or private charities is to give a bounty on pauperism itself, as human nature is so soft that people will accept such relief who are not really destitute, and who would be able to provide for themselves if they were forced to do so. To bring the allegation of destitution to the test it is said the one way is to give relief exclusively in the workhouse, so that candidates must go to the workhouse if they are to have such relief at all. In proof of this contention numerous special cases are cited of the gradual application of the workhouse test in one Union after another; and this, it is said, raised the basis for the conclusion that much of the improvement of this country as regards pauperism must be ascribed to the Poor Law administration of the last fifty or sixty years, during which time there has been a constant pressure by the Local Government Board in favour of indoor as against outdoor relief. The arguments in favour of this course have been warmly disputed of late, but beyond mentioning the dispute I do not propose to give any details. The question is one of administration which is not to be determined exclusively by statistical evidence, although it is obviously one in which the proper figures may be, and will be, very useful to those who understand the administration. My own opinion, based on some study of the statistics, is entirely in favour of indoor as against outdoor relief, although the result at first may not be economical. It is highly desirable in the interest of the poor themselves that official relief should be confined to cases of absolute destitution.

It is astonishing how people are able to shift for themselves and for their relatives when severe pressure is applied to them, and consequently the application of such pressure is the wisest charity for the people concerned.

Another way in which the statistics have been used is that of instituting a comparison between the variations in the number of paupers and the variations in the course of trade. A distinct connection is undoubtedly traceable between times of trade depression and times when the number of paupers increases, and *vice versa* between times of trade prosperity and times when the number of paupers diminishes. It is partly in consequence of an assumed connection of this kind that care is taken to publish returns of the number of paupers weekly and monthly, and these returns have now come to be considered a barometer of the course of trade generally. Any untoward incident of trade, such as a great strike in a large branch of industry like coal-mining, is at once reflected in the returns, especially in those localities where the people suffering from the untoward incident reside. On this point readers may be referred to the Labour Gazette of the Board of Trade, which deals in a very comprehensive manner with pauperism as with other statistics bearing on the condition of labour. Reference may also be made to the evidence given by Mr. Llewellyn Smith some years ago before a Committee of the House of Commons on the Unemployed, in which he explained fully the evident coincidence between the number of paupers and the state of trade

from time to time, and brought the facts into relation with other facts, such as the rise and fall of revenue, the rise and fall of imports and exports, and the rise and fall of the consumption of articles like tea, sugar, alcohol, and tobacco.

It will be understood, of course, that hitherto we have been dealing with what is legal pauperism, and it has now to be added that legal pauperism is, of course, not co-extensive with the real pauperism in a community, which ought to cover the numbers of people who are dependent on contributions from the charitable in any form, because economically and socially the effect is to some extent the same. It is the fact of existence upon funds which are provided by other members of the community without any equivalent being given therefor which is the characteristic of pauperism, an existence of this kind being obviously fatal to any self-respect among the recipients, while the receipt of relief, if too easily submitted to, tends to weaken their moral fibre. Nothing more can be done, however, to all appearance, as far as statistics are concerned, than to mention the fact of there being other pauperism as well as legal pauperism, because the statistics are not in such a shape that any precise account can be given. One has merely to look at the long list of charities given in Sir Henry Burdett's *Hospital and Charities Annual* to perceive the immense number of the agencies for giving relief, which are in fact agencies of much the same nature as the Guardians of the Poor themselves. Some charities are worse than

others in their demoralising effect, but to a certain extent all of them compete with the official agency for giving relief, and probably some of them are far more demoralising in consequence of the indiscriminate way in which the relief is afforded. In addition to all such miscellaneous charities it has also to be considered that almost every church or chapel throughout the kingdom administers charity of a similar kind, each church or congregation having its own body of poor; it would be hard to say how much the annual amount spent upon the poor under the Poor Law is increased by such charity. One special class of such institutions may be mentioned, viz. the hospitals, which in recent years, according to Burdett's *Hospital and Charities Annual*, have administered an annual income of nearly 2 millions sterling. A great deal of this administration is, no doubt, without any demoralising effect, because people would not be ill and in a condition to receive hospital treatment if they could avoid it, while it may even be arguable that the State should directly assume the cost of administration of hospitals, but the amount may be some indication at least of what the extent of this business is. Economically we must not be satisfied with looking merely at the official returns of pauperism. In one aspect, also, hospitals have a demoralising effect in consequence of the facility with which out-patients, as they are called, are received and treated. In 1893, in the voluntary hospitals receiving grants from the Metropolitan Hospital Sunday Fund in London alone, which

served an aggregate population of about 4,500,000, the total number of in- and out-patients was 966,000, or about one-fifth of the population of London, and it is impossible to suppose that one-fifth of the population of London were in a condition to require gratuitous medical relief. Making all allowance for the fact that these numbers include those of repeated applications, we have still in these figures a record of dependence upon charitable relief which is not creditable to the people of London. The in-patients, it may be observed, numbered 68,000 out of the above total of 966,000, and while to this extent one may admit the necessity and utility of the hospitals, so that they cannot be considered demoralising in respect of the relief so given, because no one would be seriously ill on purpose, yet it may well be doubted whether advantage to the community results from the indiscriminate granting of out-door medical relief. It appears, also, from the same book (see p. 89 of issue for 1896), that the increase of hospital relief has been out of all proportion to the increase of population. Between 1883 and 1893 the increase of population was something like 10 per cent, while the increase of in- and out-patients was nearly 50 per cent, and in out-patients alone it was almost exactly that proportion. We must repeat again, therefore, that the whole problem of pauperism is most difficult to deal with statistically, and that, although the official statistics can be used with care for certain purposes, we must not suppose that we have in them a complete account of social wreckage.

These remarks are especially applicable when we come to deal with the question of pauperism or quasi-pauperism in the statistics of foreign countries and the colonies. In most countries there is almost a complete absence of any statistics to compare with those of pauperism in this country. The legal right to relief does not appear to have been conceded to any population outside England. We must not conclude, however, that the economic evil of pauperism does not exist elsewhere because there is nothing to correspond with our official pauperism. On the contrary, there is no doubt of the existence of great extremes of poverty everywhere, and of contributions from charitable and other funds towards the support of that poverty on a very extensive scale, although it may be difficult to bring the facts into a statistical form. In most continental countries, for instance, there appears to be a great deal of legalised beggary, as any one who has noticed the crowds at the church doors in Paris and other continental cities will bear witness. In France, again, there are contributions by the Government towards public assistance and infirmaries or hospitals, and in Germany there are institutions answering more nearly to the institutions of Guardians of the Poor by which our official pauperism is managed. In America and in most of our English colonies we hear a great deal of vagrants and tramps, and occasionally, in times of great distress, we hear of vast numbers of unemployed, so that the economic evil of pauperism exists to a certain extent, although it is not brought to record and accounted for as the

official pauperism in this country is brought to record and accounted for. Sir Henry Burdett, in the book already referred to, also gives a very long list of hospitals in the United States serving much the same purpose as the hospitals in this country. In our colonies again, a great deal has been heard at different times of expenditure of an extensive character for the unemployed, so that economically a very serious evil may exist, although it may be called in the different countries where the money is spent "an experiment in socialism" or "in the common employment of labour by the community," and not an administration of charity. The matter, however, is too large to be entered upon in the absence of anything like complete statistics in any country except the United Kingdom. It is enough to point out that, just as in England no complete account can be given of the subject, because, in addition to the official pauperism, there is a large amount of pauperism of a different kind which cannot be exactly recorded, so in foreign countries, where there is no official pauperism such as we have, there is a great deal of the same economic evil which it is difficult to measure, so that it is useless to attempt making comparisons between one country and another. The final question would be whether, as a matter of economics and social welfare, it is expedient to recognise pauperism as it is done in the United Kingdom, and make provision for the legal relief of the destitute, or to ignore pauperism altogether officially, and deny the right of the destitute to relief, while really providing for them in various

imperfect ways. Under the severer régime, perhaps, pauperism itself will be repressed and diminished as compared with what it would otherwise be, but there may also be advantages on the side of the more humane treatment applied in this country, provided that humanity is not carried too far, and that the necessity of some hardness in dealing with able-bodied candidates for relief, and of the application to them of severe tests of destitution, is also recognised.

CHAPTER XVII

EDUCATION STATISTICS

In education statistics we have to deal with the social condition of the people, which is touched upon in statistics of crime and pauperism, but from a different point of view. The degree of education in a community, if it can be ascertained at all, must be one measure of its civilisation, and although at a given moment no exact definition can be given of how far a particular community is educated, there may be certain possibilities of measuring advance or retrogression. In education statistics we have also to do with a large Government administration, and the Government and the community desire, by means of the statistics, to obtain information on points which assist the administration. It is necessary in dealing with the statistics themselves to keep in view this double aspect of the subject, and to recollect at all times what the precise object of particular departments of the statistics really is.

In giving an account of these objects one must remark at the outset the extreme difficulty inherent in any attempt at measuring by means of statistics

the degree of education in a community. Statistics can only deal with plain and definite facts capable of being counted, and it is obvious that nothing can be more difficult to put into a statistical form than the statement as to whether a particular person is educated or not up to a definite standard. Either the standard is of such a kind that the fact of its being reached tells you nothing as to the real education of the people, or the fact of its not being reached, supposing it to be placed very high, also tells you nothing of the real condition of the people below that standard. Still, various efforts have been made in this direction owing to the great interest attaching to the subject. For instance, in the returns of marriages an endeavour has been made to obtain some insight as to the condition of the people in the matter of education by keeping a record of the number of people who sign their names in the marriage register with marks only. It is supposed that, according to the change in the proportion of people signing with marks, an indication can be obtained as to the extent to which the elementary knowledge of reading and writing is diffused in a community. The difficulty, of course, is that the real education of many people who are unable to read and write, or to read and write fluently, may, owing to their natural ability, often be much better than the real education of those who can read and write. The statement accordingly does not carry one a very long way as to the real condition of education in a community, although it is obviously quite clear

that a general elementary knowledge of reading and writing, other things being equal, must promote indefinitely the real education of a community. Similarly statements have been obtained as to the proportion of recruits entering the army and navy who are able to read and write; as to the number of persons convicted of crime who are able to read and write, and so on. Beyond these efforts, however, little apparently can be done, in a direct manner, to show the different degree to which one community, as compared with another, may be educated, or to which a particular community may be educated at one time as compared with another. All that can be said is that the statistics do not lend themselves to such comparisons on account of the inherent difficulty of defining the meaning of the words "an educated person," and the difficulty for statistical purposes of distinguishing and counting persons who are educated.

The main objects then sought for in education statistics are more or less administrative objects. The Government and the community wish to know certain things connected with the subject which may assist in the administration.

One of the things which it is mainly desired to know is the number of people receiving different kinds of education in a community, these kinds being more or less well defined for purposes of administration. The three great types of education have now come to be settled as, first, primary education: the education in the three R's mainly, as it is understood

in England; next, secondary education, the more advanced education which children receive in the intermediate period between the primary education and their entrance either upon the work of life or upon university education; finally, university education or a higher education, in some form or another, analogous to that of the university. Accepting these different types, it is possible, by means of statistics, to make a count of the number of persons in a community receiving such education, and it is also possible to compare such numbers with the numbers of people at corresponding ages, so that the proportion of the community receiving the education, as well as the total numbers, can be ascertained. Such figures may not carry one a very long way, because in themselves they tell nothing of the quality of the education given, which may be all important. But for purposes of administration they seem to be useful, and even indispensable.

Along with such statistics also there may be statistics on such points as the accommodation in schools for children, as compared with the numbers for whom accommodation ought to be provided, and so on. The point of view, it should always be understood, however, is essentially administrative and practical, and it must not be supposed that in this way any very exact knowledge can be arrived at as to the degree of education in a community: for comparative purposes especially the statistics may be defective and misleading. In one community almost all the children of school age may be inside the schools and receiving

primary education, whilst those receiving what is called secondary education and university education may also bear a large proportion to the population of corresponding age. But the quality of the education may be so indifferent that the community really may be much less well educated than another community in which the proportions of those receiving primary, secondary, and university education are less, but the quality of the education all through is better.

Administratively, of course, the statistics may be especially useful upon another point. There are four principal data to be considered, for instance, in primary education: first, the number of children between given ages who ought to be receiving such education; second, the amount of accommodation in the schools for such children; third, the number of children on the school registers; and fourth, the average number of children in attendance. The latter, of course, becomes the most important factor, and a great deal will turn for administrative purposes on a comparison between the numbers on the register and the average numbers in attendance. Unless the proportion of the latter to the average numbers on the register is a very high one, the mere fact of so many names being on the register will tell very little, while it may also happen that, with a low average attendance, the numbers really receiving a steady education may be very small, the average being made up of one set of children at one time, and another set at another time, very few being in regular attendance.

In the same connection we must also refer to the statistics of the number of passes at the different examinations. In addition to the test of attendance there is the test of results, whether the children, in fact, have received education up to a certain standard or not. Formerly, in the English system of primary education, a great deal of importance was attached to this question of results. Grants were made by Government to schools under local authorities according to the number of pupils passing certain standards of examination. The wisdom of this method of payment was much criticised by many persons engaged in teaching, and it is clearly not entitled to be considered an exclusive test of the excellence of teaching; but whatever may be its exact value, of which educational experts can alone be the judges, the fact of its being used in administration justifies the study of the records by those engaged with the statistics of education itself. Similarly, a certain value attaches to the records of examinations at the more advanced stages of education, whether secondary or university. The certificates granted in connection with the University Extension examinations, and the different kinds of degrees given at the universities themselves, are here all matters to be inspected and studied by those interested in education. It cannot be repeated too often, however, that the statistics here are of a kind to give very little information except to those who are acquainted with the subject-matter of education itself. The statistics themselves tell very little to the outsider.

Another matter connected with the administrative side of education is that of the teaching power itself. The statistics of the number of teachers, especially of those connected with primary education, of the proportion of these numbers to the children being educated, and of the different grades of the teachers, are clearly all important matters for administrative purposes. Equally so are the statistics of the teachers connected with training colleges and the students at these colleges. To those who are able to understand the quality of education and the qualifications implied in the different grades of teachers, the statistics here must be of obvious utility. In this connection also, the remuneration of the teachers and the changes in the remuneration from time to time become important matters requiring individual statement and development.

Another branch of the statistics relating to education, which becomes very important for administrative purposes, is that of the expenditure, especially the expenditure by the Government and by local authorities. Finance is clearly a point in connection with the subject to which the attention of the community may be properly directed, although it does not follow that the results in the matter of education are necessarily proportionate to the expenditure. In this matter, for obvious reasons, a great deal depends upon efficiency, perhaps more so than in almost any other case, although efficiency in every kind of expenditure is undoubtedly most important. In comparing two communities together, expenditure is plainly an element

as to which comparison is possible and useful, though it should always be interpreted carefully and not too much stress be laid upon it. The difficulty in comparing two communities may often be that in the one the whole expenditure for education may be made by the State and the local authorities, while in the other (as in England) there may also be a very considerable expenditure by private individuals, and unless the different conditions in different countries are attended to, the mere comparison of what is spent by the Government in each case may be extremely misleading. A comparison of the same community at different times may be similarly misleading, the expenditure by private individuals at one time compared with another being much greater in proportion, so that the account of the expenditure by the State and the local authorities does not tell everything in relation to the expenditure by the whole community upon education.

The student of statistics must accordingly keep in mind the very limited scope of education statistics. It is only by the most careful study, if at all, that any conclusions can be drawn as to the degree of education in different countries, while in all cases it has to be considered that education in reality is continued outside schools or universities, and that a given community may excel in the practical work of life, thanks to the general atmosphere into which its members are thrown after they leave school or college, as compared with a community in which there is no such stimulating atmosphere at a similar

period of life. In other words, statistics in this matter are necessary and helpful, but there are few branches of statistics in which so much care has to be used in arriving at conclusions when comparisons are made.

It will be impossible within the limits of a book like the present to illustrate at the length that might be considered expedient, by those especially interested in education, the principles which have been stated. It would almost be necessary to write a treatise on education itself, in order to show how the statistics may be used. A few illustrations only will accordingly be given. The first relates to the point already mentioned as to the average number of children in attendance. In England and Wales it is found that in 1897 the number of Primary Day Schools inspected is given as 19,958, or almost exactly 20,000. The number of children who can be accommodated in these schools is given as 6,215,000; the number of children on the register as 5,507,000, and the average number of children in attendance as 4,489,000. These figures show that each school on the average has accommodation for about 310 children; that on the average in each school there are some 275 children on the register, and the average number of children in attendance is 224. The tables of the *Statistical Abstract* do not show one figure which it is most desirable to have, viz. the number of children of school age with which these different figures might be compared, but such a table will be found in the Report of the Committee of Council on

Education (p. 16 of the issue for 1897–98). It should be noted that the census figures do not lend themselves readily to such a comparison, because the ages of children in the census are not given for each year of life after five years, but in periods of five years, and the maximum limit of age up to which children must attend school if they have not passed the standards does not coincide with these census periods. The difficulty can, however, be surmounted by those who are well acquainted with the figures and the required numbers estimated, but precise comparison is out of the question. The following are the figures given:

NUMBER OF DAY SCHOLARS (ENGLAND AND WALES) ON THE REGISTERS OF INSPECTED SCHOOLS COMPARED WITH THE ESTIMATED POPULATION OF SCHOOL AGE.

Age.	Estimated population in the middle of 1897. (Thousands.)	Number of scholars on the registers of inspected schools. (Thousands.)	Percentage of number in attendance on estimated population.
2 and under 3	737	3·5	0·5
3 „ 4	730	185·8	25·5
4 „ 5	733	400·7	54·7
5 „ 6	731	564·1	77·2
6 „ 7	728	598·2	82·2
7 „ 8	724	603·0	83·3
8 „ 9	719	599·5	83·4
9 „ 10	712	611·4	85·9
10 „ 11	705	605·5	85·9
11 „ 12	697	577·7	82·9
12 „ 13	687	495·0	72·1
13 „ 14	677	206·3	30·5
14 „ 15	665	56·3	8·5
	9245	5507·0	

It cannot be said that these figures are satisfactory. Even between the school ages of 5 and 12 the maximum percentage of children of a given age in attendance is 85·9, and after 12 years of age the percentage very rapidly falls.

The figures in the volume of the *Statistical Abstract*, from which the figures first cited were taken, go back to 1883, and since that time the following changes have taken place with regard to schools, the accommodation, the number on register, and the number in attendance:

DAY SCHOOLS IN ENGLAND SHOWING THE NUMBER INSPECTED, NUMBER OF CHILDREN WHO CAN BE ACCOMMODATED, NUMBER OF CHILDREN ON REGISTERS, AND AVERAGE NUMBER OF CHILDREN IN ATTENDANCE IN 1883 AND 1897.

	1883.	1897.	Increase.
Number of schools inspected . .	18,540	19,958	1418
Number of children who can be accommodated, in thousands .	4,670	6,215	1545
Number of children on school registers, in thousands . .	4,273	5,507	1234
Average Number of children in attendance, in thousands . .	3,127	4,489	1362

The effect of this is that while the increase of the number of schools inspected is something less than 10 per cent, the increase in the accommodation provided is nearly one-third. The increase in the number of children on the school registers is also not far from one-third, and the increase in the average number of children in attendance is between 40 and 50 per cent. As far as it goes, the record is

one of an improvement in the means of education, whatever qualifications and drawbacks may have to be stated by those who are intimately acquainted with the subject. The education authorities appear to be satisfied of the reality of the improvement, and it is pointed out that the improvement in the average attendance of children is even greater than the figures show, because the number on the registers is the number at the end of the year, whereas the average attendance is the average at different dates throughout the year; so that as the number of names on the registers is steadily increasing, the average numbers attending are constantly being compared, not with the average on the school register properly belonging to the same period, but with a constantly higher figure.

The similar figures for Scotland show, in 1897, 3086 as the number of Primary Day Schools; number of children who can be accommodated, 844,000; number on school registers, 717,000; and average number of children in attendance, 605,000. Here the average number of children who can be accommodated, of children on school registers, and children in attendance per school are all somewhat less than the similar averages for England; but the proportions of numbers on the register and average numbers in attendance to the total accommodation appear to be much the same. When we go back to 1883, however, it is found that the number of schools is almost exactly the same, somewhat higher figures having been reached in the interval, and that the

average attendance has increased from 433,000 to 605,000, being an increase at much the same rate as in England. The improvement in both cases, in Scotland as well as England, is much greater than the increase of population in the interval, and would appear so far to justify the satisfaction of the authorities, although, as has been said, only those who are experts in the matter can form an opinion as to the qualifications or drawbacks to this apparent improvement in the means of education.

The figures for Ireland are on a somewhat different basis from those of England and Scotland, as they do not show at all the amount of accommodation in the schools, and also the figures do not show for a series of years the number of scholars on the registers, but down to 1895 the total number of pupils who made at least one attendance within the year. There are also other differences. It appears, however, that the number of schools in operation, 8631, is much larger in proportion to the average number of pupils in attendance, viz. 521,000, than is the case in either England or Scotland. This gives a figure of about 60 only for each school, as compared with 200 for Scotland and about 224 for England. The average number of pupils in attendance has also increased much less in Ireland than in either England or Scotland, there having, in fact, been a decrease as compared with several years intermediate between 1883 and 1896, though not a very great decrease. This stationary condition of things in Ireland is probably to be explained in part by the decrease of

population as well as by the fact that a national system of education, under the control of the central government, has been in existence for a longer period in Ireland than in either Scotland or England.

Along with these statistics of primary education in England and Scotland, it has to be considered that in both countries there has been a large and increasing number of evening schools. In England the number of such schools has increased from 932, with an average attendance of 28,000 in 1883, to 4226, with an average attendance of 180,000 in 1897. In Scotland the increase is from 205, with an average attendance of 10,000 in 1883, to 1019, with an average attendance of 52,000 in 1897. What the precise value of such evening schools is, it would, of course, be impossible to say without careful study of the subject of education itself. It may be noticed that no figures are here given as to the numbers who can be accommodated in the schools, which are probably enormously in excess of the numbers attending, as the ordinary day schools may be used for the purpose, but the average number of scholars in attendance appears to be a little more than one-half the number on the school registers. It is also a point of some interest that the average attendance appears to amount to between 40 and 50 per school, or thereabouts, as compared with an average attendance of 200 and upwards at the day schools.

As regards the examinations in public elementary day schools, on the results of which additional grants

are awarded, it will suffice to mention that 197,812 entries were made in 1897, in various science and other subjects, as against some 84,417 in 1887. The numbers entered have, therefore, more than doubled. To judge from the subjects of these examinations, it should be mentioned, they can be adapted to the older scholars only, who are pursuing a course of secondary rather than primary instruction, the examinations covering Euclid and Algebra; Latin, French, and German; Mechanics, Chemistry, and so forth.

As we ascend higher in the scale the particulars as to secondary schools and as to university education are found to be more scattered, and there is little if any information to be found in official publications. It would be difficult, indeed, to say what are the number of secondary places of education and the number of places of higher education, and still more difficult to state what ought to be considered the number of students.

Reference may be made, however, to the data given in the Report of the Department of Science and Art. In 1897 there were 2424 Schools of Science under the Department, with 198,000 students eligible for grants in attendance, these figures comparing with 1952 schools and 113,000 students in 1888. Of Art Schools there were 1849 with 147,000 students. These schools are, in great part, evening schools. Examinations again form an important part of the work of the Science and Art Department. In 1897, 101,000 individual students were examined

in science (as compared with 74,000 in 1888), and some 79,000 in art.

The number of students in attendance at the Universities of the United Kingdom is about 13,000; if we add thereto the University colleges or colleges of similar rank, the attendance would be something over 30,000. It will be remarked how small these figures are compared with the population of student age.

With regard to expenditure it would be quite impossible to make up an exact account of what is spent upon education in the United Kingdom, or to give exact comparisons for a series of years. What we have before us in this connection is the expenditure from Parliamentary grants on primary education, while it is quite clear at the outset that there is considerable expenditure for education out of other sources, and by parents on behalf of their own children, which ought to be taken account of if possible when the economics of the subject are being dealt with.

In the absence of any such complete statement it may be noticed that the expenditure in the year 1897–98 out of Parliamentary grants was as follows:

Great Britain	£9,202,000
Ireland, including a small sum from rates .	1,312,000
Total . .	£10,514,000

It will be understood, however, that these figures do not include the total expenditure on primary education in this country, especially in Great Britain.

The total expenditure by school boards in Great Britain for 1896–97 is given as 12·4 millions, and in Ireland by the National Education Commissioners 1·4 millions, and of course the primary education of the people is carried on not by school boards alone but by voluntary and other schools. The expenditure from rates alone in England and Wales in connection with schools appears to have been in the same year over 4 millions sterling. We may consider, therefore, that the whole of this latter amount, together with something over 1 million sterling for the income from voluntary subscriptions and endowments in connection with voluntary schools, ought to be added to the direct grants from the central government for primary education, and that even then the total expenditure would not be shown. Primary education in the United Kingdom, therefore, must cost over 15 millions annually.

It is unfortunately impossible to show how much the total expenditure has increased, but it may be noticed that for Great Britain since 1884 the grants for primary education have risen to three times what they were. The figure in 1884 was £3,403,000, as compared with £9,203,000 in 1898. During the same period the school board rates in England alone increased from about 2 millions to over 4 millions sterling. It is, no doubt, the case that along with these increases in the public expenditure for education, a considerable decrease has probably occurred in the expenditure by parents themselves and by the authorities of voluntary schools, so that an exact

balance relating to the total amount spent upon education cannot be stated.

The figures as to secondary education and university education cannot, unfortunately, be followed out in the same way.

CHAPTER XVIII

ACCIDENTS AND INSURANCE

In dealing with shipping statistics, and again with railway and mining statistics, reference has been made to the accounts of accidents which are incidental to carrying on those industries. The subject, however, appears to be rather apart from the ordinary statistics under those heads, which relate primarily to production. No doubt they are connected with production to some extent, because the expense of accidents or of insurance against accidents is part of the cost of production itself. The feature of accidents accordingly cannot be omitted in the general statistics of such subjects. Still, this subject of accidents gives rise to different problems and considerations, and is frequently studied from very different points of view, viz. (1) the selfish one, on account of the interest taken by the community in accidents by which their own lives may be endangered; and (2) the humanitarian one, on account of the interest which the community feel by sympathy in the lives and welfare of those members of the community who are engaged in dangerous occupations. In connection

with shipping and railway accidents, the point of view as to the risk of life and injury involved to passengers has at times been very prominent, but permanently the humanitarian point of view seems to have most influence. A special account, therefore, of accidents appears to be required in a general study of statistics.

It is not possible to separate altogether the different points of view in making up and presenting statistics of accidents. In some, particularly in shipping statistics and in the statistics of fire insurance, the question of the economic effect of accidents is very much present. Quite apart from any injury to life or limb, those concerned with ships and with such a business as that of fire insurance have an extreme interest in knowing the proportion of injury to property arising from the accidents, so as to obtain a guide to the necessary rates for insurance. Accordingly, in shipping statistics, for instance, the question of the number of accidents or of serious accidents can be and is treated separately from that of the loss of life which may be thereby occasioned. In all cases, also, it will be understood that there are two elements for consideration, one being the number of accidents themselves, and the other the loss of life or injury occasioned by them, the loss of life or injury not being always in proportion to the number of the accidents themselves. In a railway accident, for instance, it is frequently a kind of chance which determines the amount of loss of life or injury to limb occasioned by the accident. The result depends

very much upon the number of persons who happen to be in the train to which the accident happens. The same is the case with ships. It is the *accident*, however, which, from many points of view, it is important to study, and not merely the more or less chance results. For other reasons attention may be concentrated upon the results, and this seems to be especially justifiable when the question is as to the results upon those employed in the industry in which the accidents happen. For some purposes also, especially with reference to insurance of life, the number of accidents as distinguished from the cases of loss of life and injury, ceases to be important if general averages one year with another can be obtained. Each case of loss of life or injury to the person may, for this purpose, be treated as an accident. Still, for many other purposes accidents are clearly to be distinguished from the results, and the distinction should be kept steadily in mind in dealing with the statistics themselves.

Passing from these general considerations I propose to deal first of all with the question of shipping accidents, and the question of accidents generally at sea.

In dealing with such accidents it should be noted that in addition to the objects already stated with reference to accidents generally, one of the primary reasons, as a matter of fact, for compiling wreck statistics has been the desire of noting, for administrative purposes, the places where wrecks occur, so as to provide lighthouses and other means of preventing

the wrecks, and lifeboat stations to facilitate the rescue of shipwrecked crews and passengers. This has, in fact, been a main object kept in view, and hence we have had the publication of wreck registers and wreck charts, which have rather helped to divert attention from the other objects to be obtained by means of the statistics of shipping accidents. A wreck register and a wreck chart are, of course, not to be excluded from the purposes of wreck statistics, but they are incidental to the main objects and not exclusive of them.

These main objects undoubtedly are to inform shipowners and underwriters of the average losses sustained with a view to fixing premiums of insurance, and to concentrate attention on the causes of accidents in order to do all that is possible towards their prevention or diminution. What has been said as to the double form of the returns, the accidents themselves, and the results of these accidents as far as injuries to life and limb are concerned, has always, of course, to be borne in mind.

The data on the whole are very good, whether official or unofficial. Officially every wreck and casualty must, in this country, be reported to the Board of Trade for administrative purposes, the Board of Trade having power to direct an inquiry into every case of wreck. Unofficially Lloyds, the great insurance institution in shipping business, also requires wrecks and casualties to be reported. The facts as to wrecks, therefore, in their inception, are established under the inspection of

parties with opposed interests and duties. The record as regards loss of life and injury is also established in a similar manner. Deaths and injuries must be recorded in the log-book of every ship, which is finally deposited with the Registrar of Shipping and Seamen, an officer of the Board of Trade; and, of course, in cases of wreck, where the log-book may be lost, other means are available for having the deaths occurring ascertained. The data of the shipping statistics of accidents are accordingly good in their nature; the difficulties which arise appear to be those of definition and interpretation.

With regard to the statistics of wrecks themselves, the difficulty of definition is a fundamental one, which has perhaps not been met altogether satisfactorily in the official statistics. In these statistics the distinctions in wrecks or injuries to vessels are, first, total losses; second, serious casualties; and third, minor casualties. It may be doubted, however, whether the latter distinction is a very good one, and whether it might not be left out altogether, seeing that many things must take place on board ship which are almost minor casualties, such as the tearing of a sail, or the temporary choking of one of the tubes connected with the ship's boilers, which may never be reported at all, and which may be just as important as many things that do get reported. The definition of a serious casualty again, is not altogether a simple matter, depending to some extent upon the personal bias or taste of the official who has to make the classi-

fication. It is understood, also, that the term "serious casualty" is held to apply to every case where an accident to a ship is attended by loss of life, although the injury otherwise may in no sense be serious. On the whole, however, where a department has been engaged in making the classification for a long series of years, the rules for so doing may be considered to have operated evenly over the whole period, and the returns for comparison may be accepted, however much liable to criticism they may be in themselves for any particular year. No such difficulties of definition, it is obvious, apply to the cases of total loss, although it is necessary to include among the total losses cases where, in fact, a stranded ship has been taken in hand and refloated after an interval of greater or less duration. Subsequent success in refloating does not alter the fact that the ship is for the moment taken off the list of ships afloat.

There is great difficulty also in defining the causes of wrecks or casualties, as these causes are naturally to some extent matters of inference; while the nature of the accident, such as collision or stranding, can often be stated easily enough, the cause is a different matter. In the official statistics there are some tables designed specially to bring out the causes, or to throw light on the causes, such as tables of the ages of ships wrecked, tables as to the cargoes conveyed, tables as to the places where wrecks occur, and so on, but the problem is necessarily a very difficult one, although for administrative purposes many of the tables of this sort which appear in the wreck statistics have been

most serviceable, and have led to more or less useful regulations for the prevention of wrecks.

A special difficulty arising in connection with collisions may be adverted to. A collision by its nature necessarily affects more ships that one; usually two, but occasionally it would appear three, ships may be involved in one collision. The question arises then how a collision is to be stated in the statistics. For many years the practice was to treat a collision as an event, and then the number was included with other accidents, which from their nature occurred to one ship only. It was thought, however, at a later date that this might be misleading, and it was required that the statistics should relate to the number of ships involved in the accident so as to bring them on a par with the figures relating to other accidents to ships. What the statistics now contain, therefore, on this head, is not the number of collisions, collisions being treated as events, but the number of ships suffering from collision which, theoretically, is not quite the same thing. This does not prevent the number of collisions themselves being separately stated.

It is immediately noticeable also when statistics of shipping accidents are looked at in this way, that the question of loss of life at sea cannot be confined to the loss of life by what are called wrecks of the ships themselves. There are other accidents at sea through which loss of life or injury to the person is sustained without any danger or injury to the ship at all. These are individual losses incidental to the calling of those who follow the sea. In addition, therefore, to

the statistics of wrecks proper, which include the loss of life occasioned by such wrecks, it is necessary to add an account of the loss of life or injury occasioned to the crews of ships by accidents which are not connected with injury to the ship itself. Much confusion at one time existed with reference to the statistics of loss of life at sea by the neglect of this distinction, the assumption being made incorrectly that the loss of life by wrecks was the total loss of life to the crews of ships at sea. The distinction when stated is obvious enough, and must not be lost sight of.

The importance of the subject in the study of statistics generally would hardly justify very many figures here, but we may state one or two very shortly. In recent years the number and tonnage of vessels belonging to the United Kingdom may be put at 12,500 sailing vessels of 2·8 million tons, and 8500 steam vessels of 6·2 million tons; and the total loss at sea amounts annually to about 360 vessels for sailing ships and about 75,000 tons, and to 130 steam vessels and 100,000 tons, the proportion to the sailing and to the steam fleet respectively being as $2\frac{3}{4}$ and $1\frac{1}{2}$ per cent. Going back for a series of years, it is found that there is a great reduction both in the number and tonnage of vessels totally lost, coincident with the transformation of the fleet from sailing to steam which has been going on. It is unnecessary to go into detail, as the fact is well known, and has been accompanied in the same period by a great reduction in the average cost of insurance.

Similarly there has been a reduction in the loss of life at sea in vessels belonging to the United Kingdom, although here it will be understood the loss of life is a somewhat irregular concomitant of the wrecks themselves. Following the last number of the *Statistical Abstract*, it is found that, whereas in 1882 and 1883 the loss of life among the crews of sailing and steam vessels together amounted to 1871 and 2605, yet the figures in 1895 and 1896 were only 1340 and 833. This decrease appears to arise mainly from the steady diminution in the loss of life amongst the crews of sailing vessels which has accompanied the steady diminution of the sailing fleet itself, and has been accompanied by no increase or very little increase in the loss of life on steam vessels, notwithstanding the great increase of the steam fleet itself. At the same time, however, it has to be noted that there is, on the whole, an increase in the loss of life among the passengers of vessels, the numbers in 1882 and 1883 being 56 and 93 only, whereas in 1895 and 1896 they are 104 and 410, much larger figures also having been reached in the intervals. Nothing is more remarkable, however, than the great fluctuations in the loss of life among passengers arising, it is believed, in a great measure from chance causes, and taking place hardly at all among the great passenger lines with which all are familiar, but frequently on ships in distant seas carrying large numbers of coolies or Chinese. The loss of life among crews by strandings or founderings alone follows more closely that of the numbers of such casualties.

One reason for the non-increase of wrecks among steamers and of the loss of life occasioned by such wrecks is, probably enough, the increasing size of steam vessels themselves. Size is apparently an element of safety, as more capital is involved and greater strength is necessary all through the ship, if it is to carry on at all. Possibly also the comparative newness of the steam fleet may be a reason for the diminution of accidents as compared with the mixed sailing and steam fleet of fifteen or twenty years ago, which contained a very large proportion of old vessels. In any case it has also to be considered that the statistics of wrecks themselves are very fluctuating. There is a liability to hurricanes of a special severity which do not come every year, but which occur at intervals of perhaps ten years or more, while there are also to all appearance cycles of years, two or three bad years coming together, followed by long intervals of comparative quietude. To interpret the statistics aright, therefore, so as to eliminate fluctuations which may be ascribed to weather, would require very serious study, and it is doubtful whether as yet wreck statistics have been compiled and studied impartially enough to permit due force being given to the permanent causes of wrecks as distinguished from the fluctuations due to weather which are entirely beyond human control.

It will be observed from these figures as to loss of life that they are concerned merely with the loss of life by wrecks. To give an idea of what the loss of life in following the calling of the sea is, we must

accordingly include some reference to the loss of life from other causes, which appears to be very serious. The following short statement is from the official figures in the *Fifth Annual Abstract of Labour Statistics*:

NUMBER OF DEATHS OF SEAMEN IN MERCHANT VESSELS REGISTERED IN THE UNITED KINGDOM, DISTINGUISHING BETWEEN DEATHS BY WRECKS OR CASUALTIES AND DEATHS BY OTHER ACCIDENTS, AND OMITTING DEATHS DUE TO DISEASE, ETC.

Year ending 30th June.	Deaths by wrecks or casualties to vessels.	Deaths by other accidents.	Total.
1884–85	1194	701	1895
1885–86	863	653	1516
1886–87	1354	693	2047
1887–88	1176	772	1948
1888–89	968	841	1809
1889–90	914	870	1784
1890–91	1210	789	1999
1891–92	1105	810	1915
1892–93	971	649	1620
1893–94	1220	802	2022
1894–95	957	764	1721
1895–96	1154	742	1896
1896–97	899	732	1631
1897–98	488	650	1138

These are the figures relating to the actual deaths by accidents in registered merchant vessels belonging to the United Kingdom, excluding, however, fishing vessels which may be registered. They cannot be said to include all deaths in all vessels belonging to the United Kingdom, but they include nearly all, and, at any rate, they deal with the same class of vessels. A comparison can also be made between

these figures and the number of persons employed, which has remained about the same almost all through the period in question, beginning with the figure of about 200,000, and rising about ten years ago to the figure of 218,000, which has been almost a constant one since. As the number of deaths has been almost constant throughout the period, taking an average of years, we have some idea accordingly of the average loss of life at sea in merchant vessels (apart from deaths due to disease), which is rather under 1 per cent. Exceptionally in the last two years, and particularly in the year 1897–98, there is a great reduction; almost in the latter year by one-half as compared with the usual figure, but such a change, of course, can hardly be relied on permanently, looking to the wide fluctuations that occur. It will be observed that the deaths by accidents other than wreck or casualty, though they tend on the whole to diminish, at least from 1889–90, are wonderfully steady as compared with the deaths by wrecks or casualties themselves, which are more fluctuating from year to year.

It should also be understood that these figures relate to merchant vessels exclusively. It appears from returns, made at the same time, that the loss of life on fishing vessels and other boats and craft, again excluding deaths from disease, ranged in the same period from 230 to 515 deaths per annum, the average being about 340.

These figures also do not include the loss of life to passengers, which, as already mentioned, has been

of a most fluctuating character, the range being from as low a figure as 51 in one year to a figure of 1196 in another year (for vessels of all kinds belonging to the United Kingdom), showing that the loss of life to passengers is altogether an irregular occurrence, and depends very much upon the nature of the ship to which an accident happens. A single wreck, if it should happen to a ship full of passengers, may cause an enormous loss of life, while many wrecks may take place which involve but a small loss of life. It appears when the returns are analysed that some of these serious wrecks occur, as stated above, not to passenger vessels on the main lines of travel, such as would be thought of when accidents to passengers are mentioned, but frequently to vessels in remote seas carrying Chinese or coolies.

These figures are, of course, merely illustrations of the kind of information to be found in the accident statistics relating to shipping. Considering the elaborateness with which the subject has frequently been treated by special commissions and committees, I have given what may be considered very meagre illustrations indeed. But just because the statistics are so much used in practical administration, it hardly appears necessary to show more fully the kind of discussion to which the figures give rise.

Foreign statistics on this head appear to be extremely defective, comparatively little attention having been paid to such subjects as compared with what is paid in the United Kingdom, where the shipping business is relatively so much more important

than it is elsewhere. Even if the statistics were more complete than they are, they would not be of so much use as might at first be thought for comparative purposes, as some of the fleets of foreign nations, which would come into the comparison, are not in reality ocean-going fleets, but are confined to little more than coasting or local voyages, involving risks of a totally different nature from those to which an ocean-going mercantile fleet like that of the United Kingdom is exposed.

With regard to railways, it appears to be unnecessary to go so much into detail as has been done with the shipping statistics. As far as the economics are concerned, the accounts of railways appear to supply the best evidence as to what the percentage of loss is, in the shape of the figures as to compensation for accidents to goods and compensation for accidents to passengers which the railway companies have to give. For a series of years the amounts given by the railway companies of the United Kingdom as compensation under these heads has been as follows :

[TABLE

COMPENSATION GIVEN BY RAILWAY COMPANIES IN THE UNITED KINGDOM FOR PERSONAL INJURY AND FOR DAMAGE TO OR LOSS OF GOODS, IN THOUSANDS STERLING.

Year.	For personal injury.	For damage to or loss of goods.
1888	103	166
1889	246	183
1890	226	220
1891	165	258
1892	199	281
1893	127	245
1894	142	230
1895	121	232
1896	118	271
1897	116	315

Considering that in the period in question the expenditure on the working of the railways ranged between 36 and 50 millions sterling, increasing steadily from the lower to the latter figure; and that the income of the railway companies in the same period increased from about 70 to 94 millions, we must conclude from the economic point of view that the loss involved in accidents, whether to passengers or to goods carried by railways, has been very small indeed, the total of the two together upon the income of railways being between $\frac{1}{2}$ and $\frac{3}{4}$ of 1 per cent. Of course, it does not follow that these figures show the entire economic loss resulting from railway accidents; the damage to permanent way and to rolling-stock as well as other property of railway companies is not included in these items, while the injury to the servants of railway companies is also for the most

part not included, being met out of accident funds and other sources which are not included under the heading of compensation in the accounts. Roughly, however, this figure of compensation is a good index to the cost of accidents to railway companies.

With regard specially to the injury of railway servants it appears that for the latest year, 1897, the following account can be given, corresponding to the account given on p. 447 of the accidents to seamen —first, from wrecks and casualties; and second, from other accidents:

NUMBER OF SERVANTS OF RAILWAY COMPANIES OR CONTRACTORS KILLED OR INJURED BY RAILWAY ACCIDENTS IN THE YEAR 1897.

	Killed.	Injured.	Total.
Killed or injured by accidents connected with the movement of railway vehicles . . .	510	4,129	4,639
Killed or injured by other accidents	56	10,273	10,329
Grand Total . .	566	14,402	14,968

The point to notice in this table appears to be that the accidents connected with the movement of railway vehicles are far more serious than the other accidents which happen to railway servants; while these other accidents amount in number altogether to about double those of the accidents connected with the movement of railway vehicles, yet the number killed by the latter accidents is enormously in excess of the number killed in other accidents, being 510 compared with 56. Going back for a

series of years it would seem that the mortality has remained steadily about the figure of 500, the highest in the whole period being 549 and the lowest 396, but there being no sign of a steady change in one direction or the other, unless it be considered that improvement is shown in the fact that, while the accidents remain stationary as regards these results, yet the number of people exposed to accident has been constantly increasing along with the increase of railway business itself. Unfortunately, however, it is hardly possible to make a comparison for a long period of years, because, as is stated in the Railway Report of Accidents for 1896, "there can be no doubt that the number of returns of injuries to servants received by the Board of Trade has been considerably affected by the order recently made by the Department as regards the mode in which the returns are made."

At first sight, assuming the number of railway servants to be about half a million, the fact of about 500 deaths annually would seem to show that the proportion of fatal accidents is something like 1 per thousand, which is a much smaller rate of mortality from accidents than the rate of mortality from accidents to the crews of shipping, viz. about one-tenth only. The rejoinder to this, unfortunately, is that the proper figure with which to compare the accidents to railway servants connected with the movement of railway vehicles is not the total number of railway servants, but only that portion of them which has to do with the movements of vehicles or which is in fact

exposed to risk from that movement. How these numbers are to be separated from those of the other railway servants is not so clear. Probably in any case the risk of loss of life by railway working is much less than the risk of loss of life by the working of ships, but the exact comparison is not made by these figures which we are quoting, and would probably be very difficult to make.

Mining is another occupation for which there are special returns of accidents. The number of deaths from fatal accidents in coal mines is given in the official returns as about 930 in 1897, and 1025 in 1896, these figures being somewhat less, though not very much less than those for the previous twelve or thirteen years. As the number of miners is also very well ascertained, a figure for comparison is obtained which may be considered sufficiently trustworthy. In 1897 this figure shows a mortality of 1·338 per thousand persons employed, the highest figure in the previous twelve years having been 2·207 per thousand persons employed. Mining, therefore, would appear to be a much safer occupation than that of seafaring, where the mortality from accidents, as we have seen, amounts very nearly to 1 per cent. The tables in the *Abstract of Labour Statistics* also reduce the mortality from accidents in mines to a proportion per million tons of mineral raised, which it may be interesting enough to state, viz. in 1897, 4·323 per million tons raised, the highest figure in the previous twelve years having been 6·631 per million tons raised.

The fatal accidents to metal miners, according to the same returns, work out to very similar proportions. The grand total of deaths in 1897 was 49, and the proportion 1·463 per thousand persons employed, the highest figure in the previous twelve years having been 1·781 and the lowest 1·094. Metal mining is thus very much like coal mining as regards mortality, and a much safer occupation in comparison than seafaring.

Quarrying is another occupation for which there are similar returns, at least since 1895. The total deaths reported in the four years are 102, 124, 123, and 133, while the death rate from accidents appears to be rather less than the death rate from either coal mining or metal mining. The rates are given for 1895 as 0·975 per thousand persons employed; for 1896, 1·099; and for 1897, 0·997.

Returns are also obtained as to accidents in factories, from which it appears that in the year 1897 the number of people killed in non-textile factories in the United Kingdom was 470 and the number of injured 31,097 out of a total number of 2,665,731 employed. From this it would appear that the number killed is still less in proportion in factory working than it is in mining, being 0·18 per thousand persons employed. The proportion injured is also comparatively small, being 11·67 per thousand persons employed. In textile factories, in the same year, the deaths of adults numbered 30, at the rate of 0·04 per thousand employed: including children and young persons the

deaths were 43, but the rate the same. In none of the occupations included under factory working is the proportion of mortality higher than 0·42 per thousand persons employed, while the rate is as low as 0·01 per thousand persons employed among the people connected with the clothing trades, and other rates are also very low.

Returns are now obtained under a special Act of Parliament, which was passed in 1894, requiring notice of accidents to be given to the Board of Trade in certain employments which were not included either in the Factory Acts or in the Shipping or Railway Acts. The effect of these returns is that 62 people were reported as killed in 1897, and 56 in 1898, in connection with such accidents, while the numbers injured were 1154 and 1491 respectively. It is unfortunately impossible, however, to show in these cases the proportion of the accidents per hundred or per thousand of the persons employed, which it would be expedient to obtain in order to make a proper statistical comparison.

A general summary relating to accidents is contained in the *Abstract of Labour Statistics*, from which most of the above figures are taken. This Abstract shows at a glance what has already been stated as to the greater danger connected with the business of seafaring as compared with almost any other large employment. The mortality here is very high, but the numbers are comparatively small. Out of a total number of 5,279,000 employed in the railway service, in mines, quarries, and factories, and as

seamen, of whom only 218,000 are seamen in merchant vessels, it appears that the total deaths were 3812 in 1897 and 3331 in 1898, but the number of these deaths belonging to the small numbers employed in merchant vessels amounted to 1631 in 1897 and 1139 in 1898. The figures of this nature have been brought together almost for the first time quite in recent years, and it remains to be seen whether their publication and the attention directed to them will have any effect in mitigating the loss of life in the more dangerous employments, especially in the seafaring employment.

CHAPTER XIX

THE CONSTRUCTION OF TABLES

I HAVE now to state some of the rules which I have found it convenient to follow in the preparation of tables, especially of a series of tables giving the results of the collection of certain data and applying them in a special discussion. The non-official person who has to use statistics, though he finds many tables prepared to his hands, will have some advantage, I think, in understanding whether the tables put into his hands comply with sound rules of construction; but the principles are the same whether tables are prepared for general use by those who compile official statistics or are constructed by those who have to discuss statistics out of the materials officially supplied to them.

The *first* of these practical rules is that every table should be self-explanatory, and for that purpose it should have a full descriptive heading, and the headings of the columns and the side-lines should also be clear and precise.

Nothing is more common in amateur work, I may say, than the absence of these requisites in the tables.

The reader is left to gather from the adjacent letter-press in the book, sometimes from pages that are not adjacent, what the precise object of a table is, and what the headings of the columns are. Nothing can be more tantalising and bewildering. Unless the table can be read from beginning to end, without reference elsewhere, it is, if not practically quite useless, yet very nearly so. Compliance with the rule, I may also add, is of the very greatest service to the compiler of the tables. It clears his own ideas. A table is really an argument, a series of propositions in itself, and unless it is prepared with a clear idea of what is to be proved, it can hardly be a good table.

A student who is confronted by tables which do not comply with this rule, either in an original statistical compilation or in a statistical discussion, should hesitate to use them. If possible, when the tables must be used, for want of better, the student should write in the description of each table, the headings of the columns, and the full side-lines himself. It is neither safe nor convenient to use any table without. This may be the convenient place to explain that headings of columns and side-lines are practically the same things. A side-line is really the heading of a horizontal column, just as the heading of a column in the ordinary sense is the heading of a vertical column. But what is horizontal in one table might as well be vertical, as far as the logic of the table goes, and *vice versa*.

A practical illustration may be given. It is required to show the imports and exports of two

countries in a given year, say England and France. The table might be arranged either with *Imports* and *Exports* as the headings of the columns and *England* and *France* as side-lines, or with *England* and *France* heading the columns and *Imports* and *Exports* side-lines—*i.e.* :

FORM A.[1]

VALUE OF IMPORTS AND EXPORTS OF ENGLAND AND FRANCE IN THE YEAR 2000. (In millions of pounds—*i.e.* 000,000's omitted.)

	Imports.	Exports.	Total.
England	350	250	600
France	300	200	500
Total . .	650	450	1100

[1] Of course all the figures are imaginary only.

FORM B.

VALUE OF IMPORTS AND EXPORTS OF ENGLAND AND FRANCE IN THE YEAR 2000. (In millions of pounds—*i.e.* 000,000's omitted.)

	England.	France.	Total.
Imports	350	300	650
Exports	250	200	450
Total . .	600	500	1100

The two tables, though differently arranged, contain precisely the same facts. The usual rule of convenience is that the table should be arranged according to the number of "headings" that is largest. The fewer headings should be the headings of vertical columns, and the larger number of headings should

be the headings of horizontal columns; but this is not an invariable rule. In some one table of a series the "few" and "many" headings might fall differently from what they do in the majority of the series, but it would be desirable for the sake of reference that the particular table should be like the others in general form. Convenience will suggest other occasions when the rule may be departed from. The important point to keep in mind is that logically nothing turns upon what is vertical and what is horizontal in a table. All tables can be re-arranged as may be found convenient.

The *second* rule is that in addition to full descriptions and headings a table should be accompanied by full explanatory notes, where the figures are qualified in some way that cannot easily be explained in a descriptive title or heading, or where they appear to be the same, but are not the same, as figures in some other table which are supposed to be like them. Notes on other points may also be necessary. The rule is that the table in itself should be as complete as possible, though of course references to letterpress may sometimes be needed. Where these are given they should be complete and precise. There should be no ambiguity as to what passages in the text qualify the table.

It is somewhat difficult to give illustrations on this head without going to actual tables, but perhaps if the reader will look back to the specimen tables on the preceding page, I may be able to add fancy notes which will explain what I mean.

The phrases "Imports" and "Exports," as will have been gathered from what is said above, are themselves incomplete. There are what are called "general" imports into a country and "special" imports; while there are also "general" and "special" exports. Sometimes, also, bullion is included among the imports and exports, and sometimes it is omitted. And there are other differences of definition. An actual table dealing with imports and exports would probably require to be more complete in its descriptions and headings than the above specimens, and this might either be effected by rewriting the description and headings, or by adding some such note as this, which, as a rule, I should place under the descriptive title, and before the body of the table:

Note.—The figures of imports and exports in this table are in the case of France the general imports and exports. In the case of England they are all the imports and exports of merchandise; that is, the same as the general imports and exports of France, with the exception of the transhipment trade. Bullion in both cases is omitted.

The note would, of course, vary according to what the table does contain. Of course in practice imports and exports are often referred to without any such particularity, because everybody knows what is meant, but now and again one finds reasoning which is altogether wrong, through the neglect of the definitions.

A note, again, might be required for some such reason as this: the object might be to compare the

imports and exports of the two countries for the latest possible year, but for the one country a year's actual figures might be available, while the other country might be a month behind. In the latter case, therefore, in order to have a comparison at all, the figures for eleven months might be taken and a month added from the previous year. In nine cases out of ten the total thus obtained would be good enough practically for comparison, but a combined figure of this sort ought not to be used without a full explanatory note, which is required to prevent confusion and misconception, and perhaps the after discovery of an unaccountable discrepancy. The note required might run:

Note.—The imports and exports stated for France are not those of the complete year 2000, which were not available, but they comprise the trade of eleven months of that year with the addition of the figures for December 1999, and the total thus obtained is believed to be fair enough for the purpose of the comparison attempted.

To write such notes is undoubtedly a great deal of trouble, but in no other way can misunderstanding be avoided.

It may be useful to give an actual illustration of misunderstanding through want of notes. I was once asked by Sir John Colomb[1] in the Committee on the Emigration and Immigration of Foreigners the reason of the difference between the total number of emigrants stated in the Report on Emigration and the total number stated in a special return of the

[1] Report, 305 (1888), p. 102.

Progress of Merchant Shipping. The two figures contrasted were 296,691, and 330,801, although at first sight there was some justification for thinking them the same. The reason of the apparent discrepancy, as it was easy to explain, was the inclusion in the tables of the Report on Emigration of passengers going abroad who proceeded in vessels not under the Passenger Acts, while the Progress of Merchant Shipping return only included passengers proceeding in vessels under the Passenger Acts. The two returns being prepared and edited by different officers from different points of view, the fact of the two tables apparently covering the same ground had not been adverted to until an ingenious student like Sir John Colomb noticed the apparent discrepancy. Trouble would have been avoided if a note had been inserted in both tables explaining the apparent discrepancy between them, but many such apparent discrepancies arise where the editor of the one table is really unaware of the other. The headings of the table, if complete, should be sufficient to show the cause of the apparent discrepancy to the careful student (who would examine the headings more carefully than ever when he found such an apparent discrepancy), but the safe rule, where the editor of the one table knows of the other, is to insert a note.

The *third* rule in constructing tables, especially tables which are arranged in a series, or which are constructed for discussion, is simplicity, by which I mean the non-inclusion of too many terms in the same table. As a rule, I am for one term only; the figures

given where the horizontal and vertical columns intersect should, if possible, be all of one kind. The reason is that the comparison of the figures so given is to be the basis of a proposition or set of propositions, and if you introduce two or more sets of propositions into your table the comparison of those of any one set is impeded. Of course the smaller the table the less risk of confusion there is in introducing more terms than one, but even in these cases I should not recommend more than two terms at the outside.

To continue the specimen table on p. 460 we might introduce, for instance, percentage columns, adding in the description the words descriptive of the percentages, whatever they may be; for instance, "with the percentage of the imports, exports, and aggregate trade belonging to England and France respectively," and then adding vertical columns in the first form and side-lines in the second worded as follows: "percentage of total," which would, I think, be clear enough, though great care has often to be exercised in explaining what the percentage in a table really is. But if there were many vertical columns and many horizontal ones, the table with this addition would be far from clear.

Of course the addition of a third term or more is fatal to clearness. For instance, an attempt might be made, as I have seen it made, to get in a comparison for a series of years and for different countries as to one or more facts of trade. An amateur might venture on something like this:

IMPORTS, EXPORTS, AND TOTAL IMPORTS AND EXPORTS OF THE UNDERMENTIONED COUNTRIES IN THE UNDERMENTIONED YEARS. (In millions sterling, 000,000's omitted.)

	England.			France.			Germany.		
	Imp.	Exp.	Total.	Imp.	Exp.	Total.	Imp.	Exp.	Total.
2000	10	10	20	6	7	13	7	8	15
2010	15	15	30	8	9	17	10	9	19
2020	20	25	45	13	15	28	11	12	23
2030	22	27	49	14	17	31	18	15	33
2040	25	30	55	19	23	42	25	18	43

Here it would be difficult to carry the eye from column to column of imports, and the difficulty which is just surmountable perhaps with a few countries and years, as in the above specimen, would become overwhelming with the number of years down the side increased greatly, and the number of countries (each with three vertical columns) also largely increased. In all like cases I would recommend the following arrangement:

[TABLE

IMPORTS, EXPORTS, AND TOTAL IMPORTS AND EXPORTS OF THE UNDERMENTIONED COUNTRIES IN THE UNDERMENTIONED YEARS. (In millions sterling, 000,000's omitted.)

	England.	France.	Germany.
IMPORTS.			
2000	10	6	7
2010	15	8	10
2020	20	13	11
2030	22	14	18
2040	25	19	25
EXPORTS.			
2000	10	7	8
2010	15	9	9
2020	25	15	12
2030	27	17	15
2040	30	23	18
TOTAL IMPORTS AND EXPORTS.			
2000	20	13	15
2010	30	17	19
2020	45	28	23
2030	49	31	33
2040	55	42	43

Here the figures are precisely the same, but the second arrangement, I maintain, gains infinitely in clearness. There is absolutely no trouble in carrying the eye from one country to another as regards each particular, while if it is necessary to carry the eye from one part of the table to another to compare the progress of the imports and exports of any one country with another, this can also be done.

I repeat the rule then—to have one term only in a table, or if it is a short table, at most only two terms.

I do not consider as departing from the rule a table in which different things *all relating to the same thing* are expressed in different columns. In the table on p. 460 there are imports and exports for two countries, and the countries could be increased on one side and items like imports and exports on the other. In the same way, if countries were side-lined, you might show imports and exports with the proportion of one to the other, or the excess of one over the other, or their relation to some third factor which could be included. This is not including really a third term. But where a series of years as well as countries, with a subject-matter, is included, there is a third term at once, and so of other subjects.

A little practice will soon show what can be kept in and left out of a table with clearness.

It is purely a matter of convenience also, in splitting up a table, whether the separate parts are made separate tables or are made sections of one table. I am in favour of sections where all the sections can be got into the same page or the same opening, but, the principle being understood, the resulting arrangement is purely according to convenience.

A *fourth* rule is to distinguish adjacent columns by different type. This is especially useful where two terms are introduced, columns of quantities and columns of percentages. The quantities being in one

type and percentages in another, comparisons are facilitated which would be impossible if the type were the same.

Printers often make it difficult to carry out an arrangement of this kind, but it is far from an unimportant matter. The rule was introduced with good effect by Mr. Newmarch in his various writings, and particularly in the journal of the Statistical Society when he was editor. It is a most useful rule.

In MS. tables a corresponding difference in adjacent columns should be made if necessary by the use of different coloured inks.

There are also various ways of indicating by different types an increase or decrease, or whether the figures are above average or below average.

A *fifth* rule is that of economy of figures. It will be observed that in the above tables the figures are all stated to be in millions of pounds. For the purpose in hand minute comparisons of quantities being impossible, a notation which makes the unit a million is adopted. The unit might as well be a thousand millions, if circumstances required it, or thousands only instead of millions.

Many people, not accustomed to figures, complain of want of clearness in this economy. They like to see the millions written out, even if only in ciphers. But the economy is absolutely indispensable if we are to have statistics at all, and is really conducive to clearness, besides being the more logical.

The rule is especially applicable to percentages. Percentages should never be carried out to decimal

points, unless something turns upon the differences beyond the decimal. For many purposes where percentages are used in statistics, it must often be recognised that, from the want of definiteness of margin in the data, even the whole figure is too minute. A distinction, say, between one-tenth and two-tenths would have been possible, but, for practical purposes, owing to the necessary indefiniteness of the figures themselves, 12 and 13 per cent would mean the same thing. But to introduce a decimal point, to say, for instance, 12·7 per cent and 13·2 per cent, would be folly, as implying an impossible accuracy in the figures.

This rule is a necessary corollary to the caution already given against reasoning too finely in statistics.

For similar reasons the habit of continuing into statistical financial publications the shillings and pence columns, which may have their uses in pure accounts, is greatly to be deprecated. The moment that items of accounts have to be stated for statistical purposes, the shillings and pence columns should be cut away.

In the statement for general purposes of official data the same economy of figures is perhaps not practicable, as in worked-out tables. The figures have to be stated in the original documents for general purposes, and the compiler cannot always know beforehand with what detail they may be used. As the detail must exist it may as well be printed. But even here there might often be a great deal of judicious pruning. In worked-out tables, however, the rule of parsimony of figures is absolute.

A *sixth* rule must be laid down, bearing against the practice of making vertical instead of horizontal lines in the headings of columns. This statement is perhaps not quite clear unless illustrated, but illustration is easy.

What we often find in statistical tables is that the headings of the columns, instead of being in horizontal lines, as usual with reading matter, are printed in vertical lines. The specimen table on p. 460, for instance, relating to imports and exports, when printed as above, reads as follows :

IMPORTS AND EXPORTS OF THE UNDERMENTIONED COUNTRIES, ETC.

	England.	France.	Total.
Imports			
Exports			
Total . .			

That is, the headings England and France, like the rest of the table, are in horizontal lines. But often one may see tables in which England and France would be in vertical lines, viz. :

IMPORTS AND EXPORTS OF THE UNDERMENTIONED COUNTRIES, ETC.

	England.	France.	Total.
Imports			
Exports			
Total . .			

This is a form often found in concrete tables issuing from the printers' hands.

The absurdity of the arrangement is so manifest that one may well wonder why anybody who has to do with tables ever submits to it. In a large table where the headings are numerous and are of some length, not merely a single word, the inconvenience is so great as to make the table absolutely unreadable and unusable.

I could give many concrete illustrations, but as I write a Parliamentary table lies before me which will serve as well as any other as a medium, not an extreme illustration. This is in the Intoxicating Liquors (Clubs) Return No. 327, September 1892, on the last page of which there is an abstract which will be found in full (Table A) on the adjoining page. Nothing could be more inconvenient to the reader than this long row of vertical head-lines, which make it absolutely impossible to see at a glance what is the particular district to which the figures in the columns relate.

Just after my writing this, a still more striking example comes into my hands in the shape of the 38th Report of Her Majesty's Civil Service Commissioners, with Appendix (C.—7475, September 1894). I give a specimen page of Table A of that Report (Table C, p. 475)—"Number of cases dealt with in the year ending 31st December 1893."

But the enormities of this sort in official publications are, in truth, innumerable.

TABLE A.—ABSTRACT RETURN showing the Number of CLUBS where INTOXICATING LIQUORS are Consumed situate in each LICENSING DIVISION of the METROPOLITAN POLICE DISTRICT (1892).

Police Station.	COUNTY OF LONDON.																COUNTY OF ESSEX.			COUNTY OF SURREY.							COUNTY OF KENT.		COUNTY OF MIDDLESEX.							COUNTY OF HERTS.	
	Strand Division.	St. Margaret's, Westminster Division.	Kensington Division.	St. George's, Hanover-square Division.	St. James's Division.	Holborn Division.	St. Marylebone Division.	St. Pancras Division.	Paddington Division.	Finsbury Division.	Tower Division.	Liberty of the Tower of London Division.	Newington Division.	Blackheath Division.	Stoke Newington Division.	Wandsworth Division.	Penge Division.	Beaontree Half Hundred Division.	Borough of West Ham.	Stratford Division.	Borough of Croydon.	Borough of Richmond.	Richmond Division.	Wimbledon Division.	Borough of Kingston.	Kingston Division.	Epsom Division.	Bromley Division.	Dartford Division.	Highgate Division.	Willesden Division.	Brentford Division.	Spelthorne Division.	Gore Division.	Uxbridge Division.	Edmonton Division.	Chipping Barnet Division.	Waterford Division.
A	11	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
B	—	1	5	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
C	10	—	—	31	59	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
D	—	—	—	—	—	1	12	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
E	14	—	—	—	—	3	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F	—	—	4	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
G	—	—	—	—	—	1	—	3	—	15	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
J	—	—	—	—	—	—	—	—	—	1	19	1	—	—	—	—	—	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
K	—	—	—	—	—	—	—	—	—	—	21	—	—	—	—	—	—	3	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
L	—	—	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
M	—	—	—	—	—	—	—	—	—	—	—	—	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
N	—	—	—	—	—	—	—	—	—	—	—	—	10	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
P	—	—	—	—	—	—	—	—	—	5	2	—	—	—	2	—	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13	—	—
R	—	—	—	—	—	—	—	—	—	—	—	—	21	7	—	—	3	—	—	—	2	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—	—
S	—	—	—	—	—	—	—	—	—	—	—	—	—	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	—	—	—	—	—	—	—	—
T	—	—	6	—	—	5	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	4	6	10	—	—	1	1
V	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	17	—	—	—	—	19	5	7	8	3	6	4	—	—	—	—	—	—	—	—	—	—	—
W	—	—	—	—	—	—	—	—	—	—	—	—	10	—	—	8	—	—	—	—	—	—	—	—	—	—	1	—	—	—	10	4	—	2	2	—	—	—
X	—	—	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	5	—	—	—
Y	—	—	—	—	—	—	—	6	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	35	7	22	35	59	11	13	30	2	26	58	1	53	32	2	25	3	12	8	8	21	5	7	8	3	6	5	4	10	4	14	10	10	2	2	18	1	1
	414																	28			55							14		60						2	

TOTAL . . 573.

TABLE B.—ABSTRACT RETURN showing the Number of CLUBS where INTOXICATING LIQUORS are Consumed situate in each LICENSING DIVISION of the METROPOLITAN POLICE DISTRICT (1892). Table A with rows and columns interchanged.

County and Division.	Police Division.																				Total.	Total in County.
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	X	Y	
London—Strand	11	—	10	—	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35	—
,, St. Margaret's, Westminster	6	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—
,, Kensington	—	5	—	—	—	4	—	—	—	—	—	—	—	—	—	—	6	—	—	7	—	22	—
,, St. George's, Hanover Square	—	4	31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35	—
,, St. James's	—	—	59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	59	—
,, Holborn	—	—	1	1	3	—	1	—	—	—	—	—	—	—	—	5	—	—	—	—	—	11	—
,, St. Marylebone	—	—	—	12	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	13	—
,, St. Pancras	—	—	—	16	2	—	3	—	—	—	—	—	—	—	—	3	—	—	—	—	6	30	—
,, Paddington	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—
,, Finsbury	—	—	—	—	—	—	15	—	1	—	—	—	5	—	—	—	—	—	—	—	5	26	—
,, Tower	—	—	—	—	—	—	9	19	21	7	—	—	2	—	—	—	—	—	—	—	—	58	—
,, Liberty of the Tower	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
,, Newington	—	—	—	—	—	—	—	—	—	—	11	10	—	21	—	—	—	1	10	—	—	53	—
,, Blackheath	—	—	—	—	—	—	—	—	—	—	—	1	—	7	24	—	—	—	—	—	—	32	—
,, Stoke Newington	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	2	—
,, Wandsworth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	8	—	—	25	—
,, Penge	—	—	—	—	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	8	414
Essex—Beacontree Half Hundred	—	—	—	—	—	—	—	—	9	3	—	—	—	—	—	—	—	—	—	—	—	12	—
,, Borough of West Ham	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—	8	—
,, Stratford	—	—	—	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—	8	28
Surrey—Croydon	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	19	—	—	21	—
,, Borough of Richmond	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—	—	—	5	—
,, Richmond	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—	—	—	7	—
,, Wimbledon	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	—	—	—	8	—
,, Borough of Kingston	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	3	—
,, Kingston	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	—	—	—	6	—
,, Epsom	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1	—	—	5	55
Kent—Bromley	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	4	—
,, Dartford	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	—	—	—	—	—	—	10	14
Middlesex—Highgate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	3	4	—
,, Willesden	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	—	10	—	14	—
,, Brentford	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	—	—	4	—	10	—
,, Spelthorne	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	—	—	—	—	10	—
,, Gore	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	2	—
,, Uxbridge	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	2	—
,, Edmonton	—	—	—	—	—	—	—	—	—	—	—	—	13	—	—	—	—	—	—	—	5	18	60
Herts—Chipping Barnet	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—
,, Watford	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	2
Totals	17	10	101	29	19	6	28	20	31	18	11	11	30	37	34	12	26	51	38	25	19	573	—

TABLE C.—Showing for each DEPARTMENT the NUMBER of CASES dealt with in the year ending December 31, 1893, and the manner in which the cases decided within the same period have been disposed of.

DEPARTMENT AND CLASS OF SITUATION.	Number of Cases dealt with.					Number of Persons														
	General Total.	Of Candidates nominated singly.	Of Candidates nominated to compete.	Of Candidates at Open Competitions.	Of Candidates to be registered as Copyists or Messengers.	Who were absent, declined, or withdrew.	Who were not within the limits of AGE.	Whose HEALTH was not satisfactory.	Whose CHARACTER was not satisfactory.	Who were excluded by Departments for other reasons or for reasons not mentioned.	Who were REJECTED on Examination.	Who FAILED in Preliminary Examinations.	Who PASSED the Preliminary Examination.	Who were UNSUCCESSFUL in Competition.	For whom Certificates were not required.	For whom Certificates were given				
																After Open Competition or Open Selection.			After Nomination.	Under Clause VII. of the O. in C. of 4 June 1870.	Yet to appear, or still under consideration.
																Under Scheme I.	For Second Division.	Under Special Regulations.			
TOTALS OF ALL THE DEPARTMENTS.	30,617	8,450	2,103	19,258	806	2,056	93	253	67	137	1,614	1,635	953	10,820	1,804	9	186	1,403	5,561	474	3,552
PRELIMINARY EXAMINATIONS FOR OPEN COMPETITIONS :—																					
Public Works Office (Ireland) :—																					
Assistant Surveyor of Buildings (2nd Class), Architectural Department.	15	—	—	15	—	—	—	—	—	6	—	1	8	—	—	—	—	—	—	—	—
Science and Art Department :—																					
Assistant Keeper, South Kensington Museum (Science Branch).	14	—	—	14	—	2	—	—	—	—	—	2	10	—	—	—	—	—	—	—	—
Assistant Keeper, South Kensington Museum (Art Branch).	6	—	—	6	—	1	—	—	—	—	—	2	3	—	—	—	—	—	—	—	—
War Office :— Assistant Surveyor, Royal Engineer, Civil Staff.	38	—	—	38	—	4	1	—	—	3	—	6	24	—	—	—	—	—	—	—	—
Works, Office of, &c. :—Assistant Furniture Branch.	13	—	—	13	—	1	—	—	—	3	—	5	4	—	—	—	—	—	—	—	—
OPEN COMPETITION UNDER SCHEME I.	41	—	—	41	—	3	—	—	—	—	—	—	—	29	—	9	—	—	—	—	—

The arrangement in Table A stands self-condemned, yet an account of it would not be complete without a reference to the causes why it is ever adopted. An explanation will help the student and the public to cope with the perversity, first of all of printers, and next of certain official editors. The printers' reason for the vertical line is one of convenience. Often when columns are narrow the head-line or lines cannot be put into it without sacrificing a great deal of space, while the job is not so good or workmanlike, from a printer's point of view, if some words are too long for the breadth of a column, and have accordingly to be divided if the horizontal form is adhered to.

The printer therefore is always ready to suggest vertical headlines, and the plea with which he captivates official editors, as other persons who direct him, is the saving of expense. Often to put the tables into proper form would mean the requirement of more pages than would otherwise be necessary for the exhibition of the same facts. Sometimes the editor, being inexpert or having in view compliance with a Parliamentary order which seems to prescribe the bad form, does not see how to arrange the table in a more readable form, which he might be willing to do for the sake of convenience. In these ways then the enormities come to be perpetrated. To the convenience of the printer and a false plea of expense, the convenience of the reader, and with it the utility of many statistical tables—the very objects for which they are prepared — are sacrificed.

The sacrifice, however, is altogether unnecessary. Tables can always be rearranged if necessary to save the use of such vertical lines, which ought never to be tolerated, and this often without increased space, and consequently without increased expense, though neither space nor expense ought to be spared for the sake of clearness.

In the case of such a specimen table as that of imports and exports on p. 471, it is obvious that no space is saved by the use of the vertical line. Its use is pure perversity on the part of the authors or printers of the tables. But in the case of the table relating to Clubs (Table A) it may be useful to show how clearness can be introduced. To make the table clear then, all that has to be done is to turn it upside down, on the principle stated on p. 460—that is, to make the headings of columns the side-lines, and the side-lines (which are here only letters) the headings of columns, which I have done in Table B. The resulting table is thus exactly the same size as the original, but it can be read with ease and thus fulfils the primary object of putting facts in a tabular form at all. Other tables might be more difficult to arrange, but with attention to principles and the object of the table such difficulties can always be overcome. Often, as in the present case, there would be other good reasons for the rearrangement beside that of avoiding vertical head-lines. In the re-arranged table at p. 474, it will be observed, the facilities for addition and grouping given by the changed form are considerable, and the results are fuller as well as clearer.

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Title Statistics (written about the years) 1893-1900. Stat
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